

ON THE COLLECTION OF LYCOSID SPIDERS IN THE ZOOLOGICAL SURVEY OF INDIA, (INDIAN MUSEUM) WITH CRITICAL NOTES ON THE SPECIES.

By T. B. SINHA, *M.Sc., Research Scholar, Zoological Survey of India, Calcutta.*

CONTENTS.

	Page.
Introduction	9
Acknowledgement	10
Key to the Genera	10
Systematic Account	11
Summary of Geographical Distribution	49
References	50

INTRODUCTION.

The work of checking and rearranging the identified material of spiders in the collection of the Zoological Survey of India, which had a good part of its collection affected during the Varuna floods of 1943 (Chopra 1946) was undertaken at the suggestion of Dr. S. L. Hora, Director of the Survey. The present notes relate to the family Lycosidae. Besides the identified collection, the unnamed material of the family, collected by the staff of the Zoological Survey of India from Eastern Ghats Survey, Nerbuda Survey, Chota Nagpur Survey, Chilka Survey and from other places has also been identified and the results incorporated in this paper.

The arrangement proposed by Gravely (1924) has in the main been followed in this work.

The earlier description of *Hippasa nilgiriensis* Gravely (1924) is quite inadequate. It has, therefore, been described in greater detail and its systematic position discussed. Certain species which were hitherto known only from their type-localities have now been recorded from other places.

Measurements have been given only of the females. Field observations, where available, have been incorporated and an attempt has also been made to record, as far as possible, the complete distribution of the species dealt with in this paper.

The collection of Lycosidae examined consists of 39 species of 6 genera as follows :—

Genus *Hippasa* Simon.

- | | |
|------------------------------------|----------------------------------|
| 1. <i>H. himalayensis</i> Gravely. | 3. <i>H. olivacea</i> (Thorell). |
| 2. <i>H. nilgiriensis</i> Gravely. | 4. <i>H. lycosina</i> Pocock |

Genus **Hippasa** Simon—*contd.*

- | | |
|---------------------------------|-------------------------------------|
| 5. <i>H. loundesi</i> Gravely. | 8. <i>H. pisaurina</i> Pocock. |
| 6. <i>H. pantherina</i> Pocock. | 9. <i>H. holmerae</i> Thorell. |
| 7. <i>H. agelenoides</i> Simon. | 10. <i>H. madraspatama</i> Gravely. |

Genus **Ocyale** Audouin.

- 11.
- O. atlanta*
- Audouin.

Genus **Lycosa** Latrille.

- | | |
|--------------------------------------|------------------------------------|
| 12. <i>L. indagatrix</i> Walckenaer. | 23. <i>L. leucostigma</i> Simon. |
| 13. <i>L. catula</i> Simon. | 24. <i>L. punctipes</i> Gravely. |
| 14. <i>L. barnesi</i> Gravely. | 25. <i>L. carmichaeli</i> Gravely. |
| 15. <i>L. bistrata</i> Gravely. | 26. <i>L. sumatarana</i> Thorell. |
| 16. <i>L. khudiensis</i> sp. nov. | 27. <i>L. fletcheri</i> Gravely. |
| 17. <i>L. prolifica</i> Pocock. | 28. <i>L. sutherlandi</i> Gravely. |
| 18. <i>L. nigrotibialis</i> Simon. | 29. <i>L. mackenziei</i> Gravely. |
| 19. <i>L. madani</i> Pocock. | 30. <i>L. annandalei</i> Gravely. |
| 20. <i>L. kempi</i> Gravely. | 31. <i>L. birmanica</i> (Simon). |
| 21. <i>L. stictopyga</i> (Thorell). | 32. <i>L. quadrifur</i> Gravely. |
| 22. <i>L. himalayensis</i> Gravely. | |

Genus **Venonia** Thorell.

- 33.
- V. himalayensis*
- Gravely.

Genus **Pardosa** Koch.

- | | |
|----------------------------------|------------------------------------|
| 34. <i>P. pusiola</i> (Thorell). | 36. <i>P. oakleyi</i> Gravely. |
| 35. <i>P. tropalpis</i> Gravely. | 37. <i>P. leucopalpis</i> Gravely. |

Genus **Evippa** Simon.

- | | |
|--------------------------------|---|
| 38. <i>E. rubignosa</i> Simon. | 39. <i>E. praelongipes</i> (Cambridge). |
|--------------------------------|---|

ACKNOWLEDGEMENT.

I am grateful to Dr. S. L. Hora, Director, Zoological Survey of India for his keen interest taken during the preparation of this work and also for providing me with the necessary facilities. My sincere thanks are also due to Mr. K. S. Pradhan of the Zoological Survey of India for his guidance and valuable suggestions and to Dr. A. P. Kapur (also of the Survey) for going through the manuscript and making some suggestions. I am also thankful to Dr. Browning of the British Museum (Natural History) for the information regarding the Types deposited in that Museum.

KEY TO THE GENERA.

- | | |
|--|-----------------------|
| 1. Sides of caput vertical. Lip as wide as or wider than long. Fourth metatarsus longer than or as long as tibia and patella together | 2. |
| Sides of caput slanting. Lip longer than wide. Fourth metatarsus shorter than tibia and patella together | 3. |
| 2. Superior claws long and slender and toothed only at the base. Anterior portion of cephalothorax somewhat abruptly elevated | <i>Evippa</i> Simon. |
| Superior claws not long and slender and armed with teeth throughout their length. Anterior portion of cephalothorax not elevated .. | <i>Pardosa</i> Koch. |
| 3. Posterior pair of spinnerets longer than the anterior pair; terminal joint of posterior spinnerets as long as the basal joint | <i>Hippasa</i> Simon. |

- Posterior pair of spinnerets not longer than the anterior pair ;
terminal joint of posterior spinnerets shorter and rounded 4.
4. Third pair of legs longer than the first pair *Ocyale* Aud.
Third pair of legs shorter than the first pair 5.
5. Anterior line of eyes always strongly procurved *Venonia* Thor.
Anterior line of eyes straight, recurved or very feebly procurved *Lycosa* Latr.

SYSTEMATIC ACCOUNT.

Genus **Hippasa** Simon.(Type ; *H. agelenoides* Simon, Minhla (Burma)).

1885. *Hippasa*, Simon, *Bull. Soc. Zool. Fr.* X, p. 31.
1900. *Hippasa*, Pocock, *Faun. Brit. Ind.*, Arch., p. 249.
1924. *Hippasa*, Gravely, *Rec. Ind. Mus.* XXVI, p. 588.
1935. *Hippasa*, Dyal, *Bull. Dept. Zool. Panjab Univ. Lahore* I, p. 142.

The genus *Hippasa* though allied to *Lycosa* differs from it in having the posterior spinners considerably longer than the anterior ones. The posterior eyes are more widely separated and the eyes of the anterior line a little wider than those of the second line. In all the species, excepting one listed here, the sternum is marked with a black median stripe. Spiders of this genus spin silken threads which expand into a sheet-like snare.

This is a widely distributed genus.

Hippasa himalayensis Gravely.

1924. *Hippasa himalayensis*, Gravely, *Rec. Ind. Mus.* XXVI, p. 593, fig. 14.
(Type-locality: Darjiling district, alt. 1,000-3,000 ft., India. *Lecto-*
type : Reg. No. $\frac{2268}{18}$. Zoological Survey of India).

Material examined.—

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
5153 5155 H2 H2	Darjiling Dt., alt. 1,000-	v-vi. 1912 (Lord	Numerous ♂♂ and
5152 H2	3,000 ft., E. Himalayas, India.	Carmichael's Colln.).	♀♀ (<i>Paralectotype</i>).
2268 18	Ditto	Ditto	♀ (<i>Lectotype</i>).
5164 H2	Sevoke, alt. 1,000 ft., Darjiling Dt., E. Himalayas, India.	iii. 1914 (Lord Carmichael's colln.).	2 ♀♀.
5161 H2	Pashok, alt. 2,000-3,500 ft., Darjiling Dt., E. Himalayas, India.	23.iv-v.1915 (F. H. Gravely).	3 ♂♂, 9 ♀♀.
5162 H2	Pashok, alt. 3,500 ft., Darjiling Dt., E. Hima- layas, India.	26. v-14. vi. 1916. (F. H. Gravely).	3 ♀♀.

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens
5163 — H2	Kalimpong, alt. 2,000-4,500 ft., Darjiling Dt., E. Himalayas, India.	(S. W. Sutherland).	2 ♀♀.
5159 — H2	Kalimpong, alt. 600-4,500 ft., Darjiling Dt., E. Himalayas, India.	24. iv-10. v. 1915. (F. H. Gravely).	1 ♀.
5158 — H2	Kalimpong, Darjiling Dt., E. Himalayas, India.	1914. (S. W. Sutherland).	1 ♂.
5156 5165 —, — H2 H2	Kalimpong, alt. 600-1,500 ft. Darjiling Dt., E. Himalayas, India.	—	7 ♂♂, 31 ♀♀.

Remarks.—Spiders of large size with the carapace always more than 5 mm. in length. General colouration is ochraceous and the pit of vulva is exposed and triangular in form. However, in one specimen from Darjiling, the pit of vulva is not triangular, but is slightly rounded. One specimen from Simla (Reg. No. 5160/H2) has been referred to this species by Gravely (1924), but in my opinion it does not belong to this species, because the anterior part of the pit of vulva is triangulate and markedly differs from all other examples. It has not been possible for me to refer it to any known species and has, therefore, been set aside for the present.

Measurements.—Body 9-14 mm.; carapace 4-6½ mm.

Hippasa nilgiriensis Gravely.

1924. *Hippasa nilgiriensis*, Gravely, *Rec. Ind. Mus.* XXVI, p. 593, fig. 1d.

(*Type-locality*: Gudalur Ghat, 3,000-6,000 ft., Nilgiris, India. *Type-*

specimen: Reg. No. $\frac{5226}{H2}$. Zoological Survey of India).

Anterior part of the pit of vulva (Text-fig. 1a) of the type-specimen of this species is angular and not rounded as figured by Gravely (*op. cit.*). Gravely (*op. cit.*) described the new species *H. nilgiriensis* and placed it along with species *H. olivacea*, and *H. lycosina* in which the anterior part of the pit of vulva is rounded. Now that the present author regards the anterior part of the pit of vulva to be angular, the species is taken out from the above group and is placed near *H. himalayensis* in which the pit of vulva is triangular. In the light of the above observation, the species may be redescribed as follows:—

General colouration is brownish yellow. Abdomen on the ventral surface is paler in the middle line. Carapace is marked with a median band extending as far as the anterior limit of the thoracic groove; a pair of lateral marginal pale bands are bounded on their outer side by fine black streaks. Eyes of the anterior row are black and small. The anterior row of eyes is slightly recurved. Small white hairs are present

in the ocular area and two long bristle-like hairs are seen between the posterior median eyes. Pit of the vulva is exposed and its anterior margin is angular as seen in the text-fig. 1a.

The species is known only from its type-locality.

Measurements.—(type-specimen). Body $12\frac{1}{2}$ mm., carapace 7 mm.

***Hippasa olivacea* (Thorell).**

1887. *Diapontia olivacea*, Thorell, *Ann. Mus. Stor-Nat. Genova* XXV, pp. 297 300 (*Type-locality*: Rangoon and Bassein, Burma).

1895. *Hippasa olivacea*, Thorell, *Descriptive Catalogue of Spiders of Burma*, pp. 217, 218.

1900. *Hippasa olivacea*, Pocock, *Faun. Brit. Ind.*, Arch., p. 250.

1924. *Hippasa olivacea*, Gravely, *Rec. Ind. Mus.* XXVI, p. 593, fig. 1c.

Material examined.—

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
2392 — 17	Kyeikpeden, Burma.	Oates.	1 ♀.
5169 — H2	Pegu, Burma.	?	1 ♀.
5170 — H2	?	?	1½ ♀.

The species has been previously recorded from Burma, Tharrawaddy Bassein, Rangoon, Bhamo and Me-tan-Ja.

Measurements.—Body 14-17 mm.; carapace 7-8 mm.

***Hippasa lycosina* Pocock.**

1900. *Hippasa lycosina*, Pocock, *Faun. Brit. Ind.*, Arch., p. 250, (*Type-locality* Nasik, India. *Type-specimen* in B. M. (N. H.) 1899. 11.2.37-38).

1924. *Hippasa lycosina*, Gravely, *Rec. Ind. Mus.* XXVI, p. 593, fig. 1b.

Material examined.—

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
5168 — H2	Helvak, Kayna Valley, Satara Dt., ca. 2,000 ft.	28-30.iv.1912. (F. H. Gravely).	1 ♂, 5 ♀♀.
5167 — H2	Bombay.	..	11 ♀♀.
?	Ditto		1 ♀.

The species has been previously recorded from Pykara, Maryland and Attakutti (S. India); E. Poona, Kanara, Nasik and Urana.

Measurements.—Body 13-20 mm.; carapace $6\frac{1}{2}$ - $9\frac{1}{2}$ mm.

Hippasa loundesi Gravely.

1924. *Hippasa loundesi*, Gravely, *Rec. Ind. Mus.* XXVI, p. 594, fig. 1b (*Type locality*: Yercaud, India. *Type-specimen*: Reg. 5225/H2, Zoological Survey of India).

Material examined.—

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
5225 H2	Yercaud, Shevaroy Hills, S. India.	vi. 1920 (Deacones Loundes).	1 ♀ [with 1 cocoon (<i>Type</i>).
2232 18	Eastern Ghats, Nagalaur, 3,900 ft., Shevaroy Hills, S. India.	6-15 vi. 1929 (H. S. Pruthi).	3 ♀♀.
2229 18	Eastern Ghats, (under- stones) at Nadur, 1,800 ft., Javadi Hills, S. India.	26-30, vi. 1929 (H. S. Pruthi).	3 ♀♀.

Measurements.—(type-specimen). Body 14 mm.; carapace 7 mm.

Hippasa pantherina Pocock.

1899. *Hippasa pantherina*, Pocock; *Jour. Bombay Nat. Hist. Soc.* XII, p. 752
[*Type-locality*: Trivandrum, Travancore, S. India. *Type-specimen*
in B. M. (N. H.) "not designated or registered but most probably
3 specimens ♂ + 2 ♀♀"].

1900. *Hippasa pantherina*, Pocock, *Faun. Brit. Ind., Arach.*, p. 250.

1924. *Hippasa pantherina*, Gravely, *Rec. Ind. Mus.* XXVI, p. 594, fig. 1f.

Material examined.—

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
5167 H2	Ceylon ?		♂ ♀.
5182 2235 H2 H2 5178 5177 H2 H2 5174 and H2 5181 H2	Chalakudi, Cochin State, S. India.	14.30.ix.1914 (F. H. Gravely).	40 ♂ 6 ♀♀ (from Webs).
	Trichur, 0-300 ft., Cochin State, S. India.	1-4.x.1914 (F. H. Gravely).	♂, 3 ♀♀.

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
<u>5179</u> H2	Cochin State, S. India.	ix. 1914 (F. H. Gravely).	2 ♀♀, ♀.
<u>2236</u> 18	Bangalore, ca. 300 ft.	15.x.1910 (N. Annandale).	♀.
<u>5183 5184</u> H2 H2	Madras, S. India.	viii. 1921. (F. H. Gravely).	2 ♂♂, 2 ♀♀.
<u>5171</u> H2	Ditto	(Madras Mus.),	2 ♂♂, 17 ♀♀.
<u>5185</u> H2	Gheria Id., Chilka Lake, Orissa.	22.vii.1914 (Chilka Survey).	♀
?	Barkuda Id., Chilka Lake, Orissa.	3-19.viii.1919 (F. H. Gravely).	♂ ♀ (In one web).
<u>5172</u> H2	Barkuda Id., Chilka Lake, Orissa.	2.xi.1924 (N. Annandale).	4 ♀♀ (a few juv. ones).
<u>2233</u> 18	Ditto	15-22.vii.1916 (F. H. Gravely).	♀, 2 ♀♀.
<u>5180</u> H2	Barkuda, Chilka Lake, 1,000 ft., Orissa.	1-3.viii.1914 (F. H. Gravely).	♂.
<u>5175</u> H2	Balighai, near Puri, Orissa.	16-20.viii.1911 (N. Annandale & F. H. Gravely).	♀.
<u>2234</u> H2	Rungjo, ca. 900 ft., Darjiling Dt., E. Hima- layas, India.	x. 1917 (F. H. Gravely).	2 ♂♂, 3 ♀♀.

This species has been previously recorded from Trincomali (Ceylon); Gulf of Manaar; Krusadai Island; Coimbatore; Ootacamund; Ramnad; Red Hills and Kambakkan Hills (Chingleput dist.);

Bangalore ; Poona district and E. Khandesh. It is now recorded from the E. Himalayas.

Measurements.—Body 10-16 mm. ; carapace $4\frac{1}{2}$ - $7\frac{1}{2}$ mm.

***Hippasa agelenoides* Simon.**

1884. *Pirata ? agelenoides*, Simon, *Ann. Mus. Stor. Nat. Genova*, XX, pp.334-335 (*Type-locality* : Minhala, Burma).
 1895. *Hippasa agelenoides*, Thorell, *Descriptive Catalogue of Spiders of Burma*, p. 218.
 1900. *Hippasa agelenoides*, Pocock, *Faun. Brit. Ind.*, Arach., p. 251.
 1924. *Hippasa ? agelenoides*, Gravely, *Rec. Ind. Mus.* XXVII, p. 595, fig. 1g.
 1935. *Hippasa agelenoides*, Dyal, *Bull. Dept. Zool. Panjab Univ. Lahore* I, pp. 142, 143.

Remarks.—Anterior median eyes are definitely larger than the anterior laterals and specimens of this species can be distinguished from *H. himalayensis*, *H. nilgiriensis*, *H. olivacea*, *H. lycosina*, *H. loundesi* and *H. pantherina* by the characteristic shape of the plate of vulva having a pair of outwardly directed truncate processes behind.

Material examined.—

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
5152 — H2	Prambikulam Cochin State, S. India.	16-24.xi.1914 (F. H. Gravely).	♂, 6 ♀♀.
2237 — 18	Eastern Ghats, Mathiapalli, Craigmores Road, 4,500 ft., Yercaud, Shevaroy Hills, S. India.	9.vi.1929. (H. S. Pruthi).	1 ♀.

It has been recorded from North Malabar ; Gudalur, foot of Nilgiris, ca. 3,000 ft., Mansahra, 5,000 ft. (W Pakistan) ; Dehra Dun (U. P.) ; Konkan, India ; Tharrawaddy and Rangoon, Burma.

Measurements.—Body 6-10 mm. ; carapace 3-5 mm.

***Hippasa pisaurina* Pocock.**

1900. *Hippasa pisaurina*, Pocock, *Faun. Brit. Ind.*, Arach., pp. 250, 251 ; (*Type-locality* : E. Khandesh, India. B. M. (N. H.) 1899, 12.5.123).
 1924. *Hippasa pisaurina*, Gravely, *Rec. Ind. Mus.* XXVI, p. 595, fig. 1h.
 1935. *Hippasa pisaurina*, Dyal, *Bull. Dept. Zool. Panjab Univ. Lahore* I, p. 143.

The most characteristic feature of the species is the triangular backwardly pointed plate of vulva, which is not as much backwardly produced as in *H. holmerae* Thor.

Material examined.—

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
5187 — H2	Bangalore, S. India, ca. 3,000 ft.	6-12. v. 1921 (F. H. Gravely).	1 ♂.
2238 — 18	Medha, Yenna Valley, Satara Dt., ca. 2,200 ft.	17-23. iv. 1912 (F. H. Gravely).	1 ♀.
2391 — H2	Poona, Bombay Presy	(R. C. Wroughton)	3 ♀♀.
5186 — H2	Siripur, Saran, Bihar		1 ♀.
2231 — 18	Baghdad.	Summer 1923 (Maj. R. W. C. Hing- ston).	6 ♀♀.

It is common in Lahore (Panjab) and is recorded for the first time from Baghdad.

Measurements.—Body 10-11 mm. ; carpace 4-5 mm.

***Hippasa holmerae* Thorell.**

1895. *Hippasa holmerae*, Thorell, *Descriptive Catalogue of the Spiders of Burma*, pp. 218-221 (*Type-locality*: Tharrawaddy, Burma. *Type-specimen* in B. M. (N. H.). 1895-9.21.731-732).

1900. *Hippasa holmerae*, Pocock, *Faun. Brit. Ind. Arach.*, p. 251.

1924. *Hippasa holmerae*, Gravely, *Rec. Ind. Mus.* XXVI, p. 595, fig. 1i.

Material examined.—

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
5165 — H2	Kalimpong, alt. 600-1,500 ft., Darjiling Dt., E. Himalayas, India.		16 ♂♂, 15 ♀♀.
5166 — H2	Between Tengueh and Nan Tien, Yanan, W. China.	1909-1910 (J. C. Brown).	1 ♀.
2393 — H2	Tharrawaddy, Lower Burma.	(Oates).	2 ♂♂, 2 ♀♀.

The species has also been previously recorded from Singapur.

Measurements.—Body 6-8 mm. ; carapace 2½-3 mm.

Hippasa madraspatama Gravely.1924. *Hippasa madraspatama*, Gravely, *Rec. Ind. Mus.* XXVI, p. 595, fig. 1j.(Type-locality: Madras city. Type-specimen: Reg. No. $\frac{5224}{H2}$, Zoological Survey of India).*Material examined*.—

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
$\frac{5224}{H2}$	Madras City, S. India.	vii-ix. 1921 (F. H. Gravely).	♂, ♀ (<i>Type</i>).
$\frac{2253}{18}$	Eastern Ghats (under-stones) at Chitteri Hills, S. India.	20-22. vi. 1929 (H. S. Pruthi).	7 ♀♀.
$\frac{2252}{18}$	Eastern Ghats, (under stones) at Nadur, 1,800 ft., Javadai Hills, S. India.	26-30. vi. 1929 (H. S. Pruthi).	1 ♀.

Remarks.—Specimens from Chitteri Hills, S. India are marked with a faint blackish median longitudinal band on the sternum, but it is absent in the type-specimen. Formerly the species was known only from its type-locality.

Measurements.—Body $6\frac{1}{2}$ mm.; carapace 3 mm.

Genus **Ocyale** Audouin.(Type, *O. atlanta* Audouin).

*1826. *Ocyale*, Audouin, in Savigny's "*Description de l'Egypte, Arachnides*" Paris, p. 149.

Spiders of the genus *Ocyale* are allied to *Lycosa* but have the third pair of legs longer than the first pair of legs and the quadrangle of the posterior eyes is much wider behind than in front. The eyes of the anterior row are slightly recurved and the medians being much larger than the laterals. Cephalothorax is thick and convex and anterior pair of spinnerets is long and cylindrical.

The genus has a wide distribution and has been recorded from Africa, Ceylon, India, Burma, Senegal, Guinea, Congo and Europe.

Ocyale atlanta Audouin.

*1826. *Ocyale atlanta*, Audouin, in Savigny's, "*Description de l'Egypte Arachnides*", Paris, p. 150 (*Type-locality*: Egypt).

1900. *Ocyale atlanta*, Pocock, *Faun. Brit. Ind.*, Arach., p. 252.

1924. *Ocyale atlanta* Gravely, *Rec. Ind. Mus.* XXVI, p. 595.

Material examined.—

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
5150 H ₃	Haragama, Ceylon.	vii. 1908 (H. Nerina).	1♀ with numerous young ones (caught as it had captured a butterfly).
5149 H ₂	Peradeniya, Ceylon.	26. vi. 1910.	1♀.
2249 18	Barkuda Id., Chilka Lake, Orissa.	5-22. vii. 1916 (F. H. Gravely).	1♀.
2886 H ₂	Barkuda Id., Chilka Lake, Orissa.	28. viii. 9119.	1♀ at the edge of the lake in Sands.
5143 H ₂	Siripur, Saran, Bihar.	viii. 1913 (Macken- zie).	1♀.

The species has been recorded from Egypt, Ethiopia, Senegal, Guinea and Congo coasts and Burma.

Measurements.—Body 10—20 mm. ; carapace 5—8 mm.

There is also an extra Indian species *O. mirabilis* Clerck from Europe and is represented in the collection by two female examples. (Reg. No. 8326/6).

Genus *Lycosa* Latrille.

(Type, *L. tarantula* Rossi).

*1804. *Lycosa*, Latrille, *Nouv. Dict. d'Hist. Nat.* XXIV, p. 135.

1900. *Lycosa*, Pocock, *Faun. Brit. Ind., Arach.* p. 252.

1924. *Lycosa*, Gravely, *Rec. Ind. Mus.* XXVI, p. 588.

1935. *Lycosa*, Dyal, *Bull. Dept. Zool. Panjab Univ. Lahore* I, p. 134.

Almost all the species of *Lycosa* Latr. listed in the present paper have the same fundamental colour scheme viz., one median and a pair of lateral, parallel or subparallel, pale, longitudinal stripe on a dark ground of the carapace and with similar stripes broken into blotches on the abdomen. Eyes of the anterior row are small and the anterior line of eyes is straight or curved with the convexity either facing backwards or forwards. Ventral margin of the chelicera is armed with three teeth and the mandibles are strong and powerful. Legs are beset with short and strong spines. Dyal (1935) treats *Xerolycosa* Dahl as a synonym of *Lycosa* Latr. I am, however, opposed to such a view since the ventral or retromargin of the chelicera of *Xerolycosa* Dahl is armed with only two teeth, while that of *Lycosa* is provided with three teeth.

It is a widely distributed genus and has been recorded from the Temperate, Tropical and Arctic countries.

Lycosa indagatrix Walckenaer.

1837. *Lycosa indagatrix*, Walck., *Ins. Apt.* I, p. 339 (*Type locality* : Coromandal Coast, India).

1900. *Lycosa indagatrix*, Pocock, *Faun. Brit. Ind. Arach.*, p. 254.

1924. *Lycosa indigatrix*, Gravely, *Rec. Ind. Mus.* XXVI, p. 599, figs. 2a & 3a.

Remarks.—Gravely (*op. cit.*) has merged *L. catula* Simon with *L. indigatrix* but in my opinion they should be considered as distinct species, as the structure of vulva is markedly different in the two species.

Material examined.—

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
5101 H ₂	Killinochchi, Ceylon.	x. 1914 (Col. R. Hedley).	1♀.
2228 18	Eastern Ghats, Nagalur, 3900 ft., Shevaroy Hills, S. India.	6-15. vi. 1929 (H. S. Pruthi).	4♀♀.
5189 H ₂	Pallavaram, Chingleput Dt., S. India.	6. viii. 1921 (F. H. Gravely).	1♀.
4899 9	S. Arcot, S. India.	vi-vii (Jaffer).	1♀.
5188 H ₂	Madras, S. India.¶	(F. H. Gravely).	1♂, 14♀♀.

The species has been previously recorded from Jalarpet, Salem district ; Pondicherry ; Horsleykonda, Chittoor district ; Wagrakaroor (Bellary) in S. India.

Measurements.—Body $17\frac{1}{2}$ -24 mm. ; carapace 10-12 mm.

Lycosa catula Simon.

1885. *Lycosa catula*, Simon, *Bull. Soc. Zool. Fr.* X, p. 457 (*Type-locality* : Collega, Coimbatore district, S. India).

1900. *Lycosa catula*, Pocock, *Faun. Brit. Ind., Arach.*, p. 254.

1924. *Lycosa catula*, Gravely, *Rec. Ind. Mus.* XXVI, p. 589.

1934. *Hogna catula*, Reimoser, *Rev. Suisse Zool.* XLI, pp. 471, 472, fig. 4.

1938. *Hogna catula*, Reimoser, *Mem. Soc. Ent. Ital.* XVI, p. 18.

Material examined.—

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
2250 18	Eastern Ghats, (understones) at Nadur, 1,800 ft., Javadai Hills, S. India.	26-30. vi. 1929 (H. S. Pruthi).	2♀♀ with one cocoon.
5190 H ₂	Bangalore, ca. 3,000 ft., Mysore, S. India.	6-12. v. 1921 (F. H. Gravely).	2♀♀.

Remarks.—Spiders of this species can be differentiated from those of *L. indagatrix* by the shape of the vulva (text-fig. 1b.) and by the white striations on the venter of the abdomen.

It has been previously recorded from Ceylon ; Coimbatore ; Yercaud ; Sheveroy Hills ; Madras ; Chingelput district ; Chittoor district ; Masnigudi and from Collegal.

Measurements.—Body upto 20 mm. ; carapace $10\frac{1}{2}$ mm.

***Lycosa barnesi* Gravely.**

1924. *Lycosa barnesi*, Gravely, *Rec. Ind. Mus.* XXVI, pp. 599, 600, fig. 3
(*Type-locality* : Dhoni Forest, ca. 1,500-4,000 ft., S. Malabar India

Type-specimen : Reg. No. $\frac{7699}{H_2}$, Zoological Survey of India).

So far the species is known only from its type-locality.

Measurements.—(Type-specimens) Body 12 mm. ; carapace 5 mm.

***Lycosa bistriata* Gravely.**

1924. *Lycosa bistriata*, Gravely, *Rec. Ind. Mus.* XXVI, p. 600 (*Type-locality* :
Madras city, India. *Lectotype* : Reg. No. $\frac{2269}{18}$, Zoological Survey of
India).

Material examined.—

Reg. No.	Locality.	Date and donor/ collector.	No. of Specimens.
$\frac{7613}{H_2}$	Madras, S. India	(Madras Mus.).	5♂♂, 4♀♀ (<i>Paralecto-type</i>).
$\frac{2269}{18}$	Ditto	Ditto	1♀ (<i>Lectotype</i>).
$\frac{7611}{H_2}$	Gmatia, Birbhum Dt. (W. Bengal).	—	3♀♀.
$\frac{7610}{H_2}$	Calcutta, India	—	2♂♂, 9♀♀.
$\frac{7612}{H_2}$	Darjiling Dt., alt. 1,000-3,000 ft., E. Himalayas, India.	May/June 1912 (Lord Carmichael).	1♀.

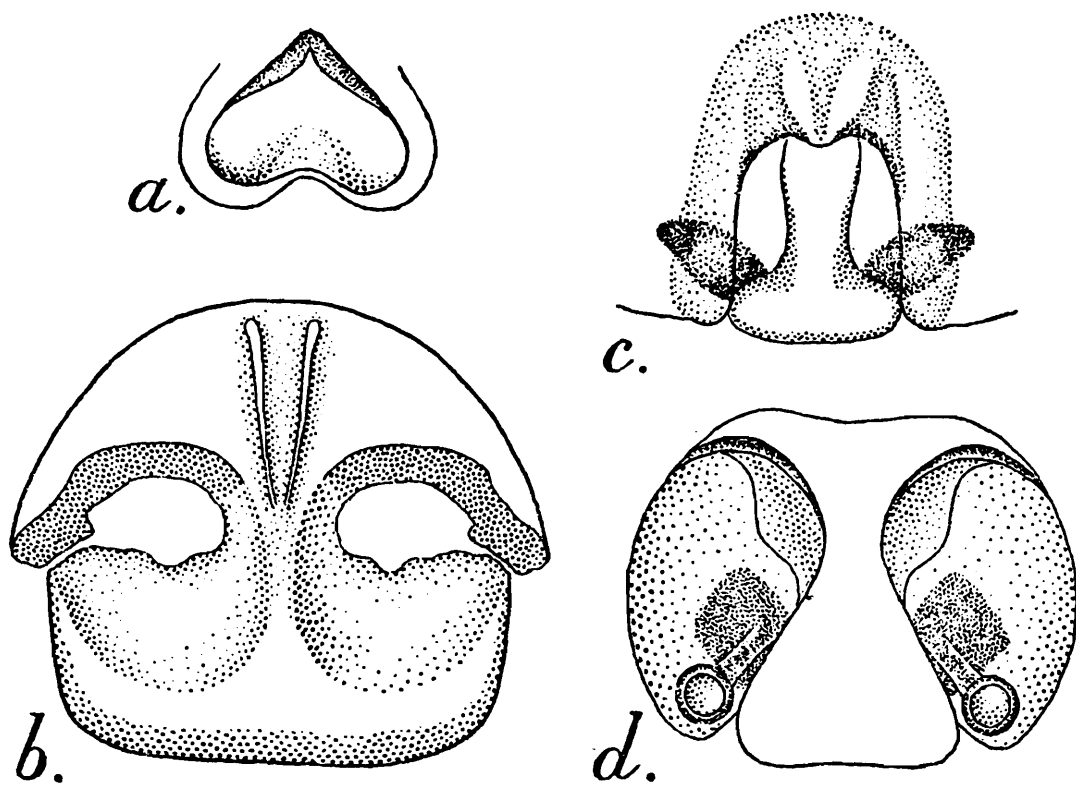
Remarks.—The coloration of male and female specimens collected from Calcutta is exactly alike, while the male specimens collected from Madras are of two different kinds as mentioned by Gravely (1924). The epigyneal plate (text-fig. 1c) of a specimen from the type locality is appended here as it has not been illustrated by Gravely (1924).

Measurements.—Body 9- $10\frac{1}{2}$ mm. ; carapace 4-5 mm.

***Lycosa khudiensis*, sp. nov.**

General colouration of the body is light yellowish and abdomen is mottled dorsally. The legs are marked with blackish annular rings. The fourth pair of legs is the longest and the anterior line of eyes is recurved. The posterior median eyes (4D in diameter) are separated from each other by a space equal to their own diameter and from the posterior lateral eyes by a space of 5 D. The posterior eyes are not much broader posteriorly.

The median piece of vulva (Text-fig. 1d.) is narrower anteriorly and is much broader posteriorly. There are also two pores one on either side of median piece of vulva.



TEXT. FIG.—1.-a—*Hippasa nilgiriensis*. Grav. Vulva $\times 50$., b. *Lycosa catula* Simon Vulva $\times 50$; c. *L. bistriata* Grav. Vulva of *Lectotype* $\times 50$; d. *L. khudiensis* sp. nov., vulva $\times 50$.

The species is close to *L. bistriata* Grav. from which it differs in the shape of the vulva, in the character of anterior row of eyes which is recurved and in the character of the posterior median eyes which are separated from each other only by a space equal to their own diameter.

Locality.—Found under stones on the bank of Khudi river, $1\frac{1}{2}$ miles south of Nirsa market, Dist. Manbhum, Bihar (T. B. Sinha, 10. xi. 1948).

Holotype.—Reg. No. $\frac{2273}{18}$, ♀ with cocoon and Paratypes, Reg. No. $\frac{2274}{18}$, Zoological Survey of India from the above locality.

Measurements.—Body 6 mm. ; carapace 3 mm.

***Lycosa prolifica* Pocock.**

1901. *Lycosa prolifica*, Pocock, *Jour. Bombay Nat. Hist. Soc.* XIII, p. 485
[*Type-locality*: Eastern district of Poona. *Type-specimen* in B. M. (N. H.) 1899. 11.2.1368146 B. M. (N. H.)].

1924. *Lycosa prolifica*, Gravely, *Rec. Ind. Mus. Arach.* XXVI, p. 600.

Material examined.—

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
5199 — H ₃	Kas, Satara Dt., 3,700 ft., Bombay Precy.	23-26. iv. 1912 (F. H. Gravely).	1♂, 2♀♀.
2389 — H ₂	Poona, Bombay Precy.	Wroughton in Ex- change from B. M. (N.H.).	4♀♀.
2254 — 18	Nurpore, (understones on hill side) Kangra Valley, Panjab.	21. v. 1926 (S. L. Hora).	1♀.

The species has been previously recorded from Pimpalner and west Khandesh, and is now recorded from the Panjab.

Measurements.—Body 13½-15 mm. ; carapace 6-7 mm.

***Lycosa nigrotibialis* Simon.**

1884. *Lycosa nigrotibialis*, Simon, *Ann. Mus. Stor. Nat. Genova*, XX, p. 330,
fig. 1 (*Type-locality*: Minhla, Burma).
1887. *Tarentula nigrotibialis*, Thorell, *Ann. Mus. Stor. Nat. Genova*, XXV,
p. 305.
1895. *Tarentula nigrotibialis*, Thorell, *Descriptive Catalogue of Spiders of Burma*,
p. 236.
1900. *Lycosa nigrotibialis*, Pocock, *Faun. Brit. Ind. Arach.* p. 253.
1924. *Lycosa nigrotibialis*, Gravely, *Rec. Ind. Mus.* XXVI, pp. 600-601, fig. 3a-b.

Material examined.—

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
5201 — H ₂	Taloshi Koque, ca. 2,000 ft., Satara Dt., Bombay Precy	27-28. iv. 1912	1♀.
5197 — H ₂	Medha, Yenna valley, ca. 2,200 ft., Satara Dt., Bombay Precy.	17-33. iv. 1912 (F. H. Gravely).	1♀.
7658 — H ₂	Kas, ca. 37,000 ft., Satara Dt., Bombay Precy.	23-24. iv. 1942 (F. H. Gravely).	2♀♀.
5206 — H ₂	Khandla, ca. 2,500 ft., Poona Dt., Bombay Precy.	6-10. iii. 1918 (N. Annandale).	1♂.
5200 — H ₂	Zangi Nawar, 20 miles West of Nushki, Balu- chistan.	25-29. xii. 1918	1♀.

Material examined—contd.

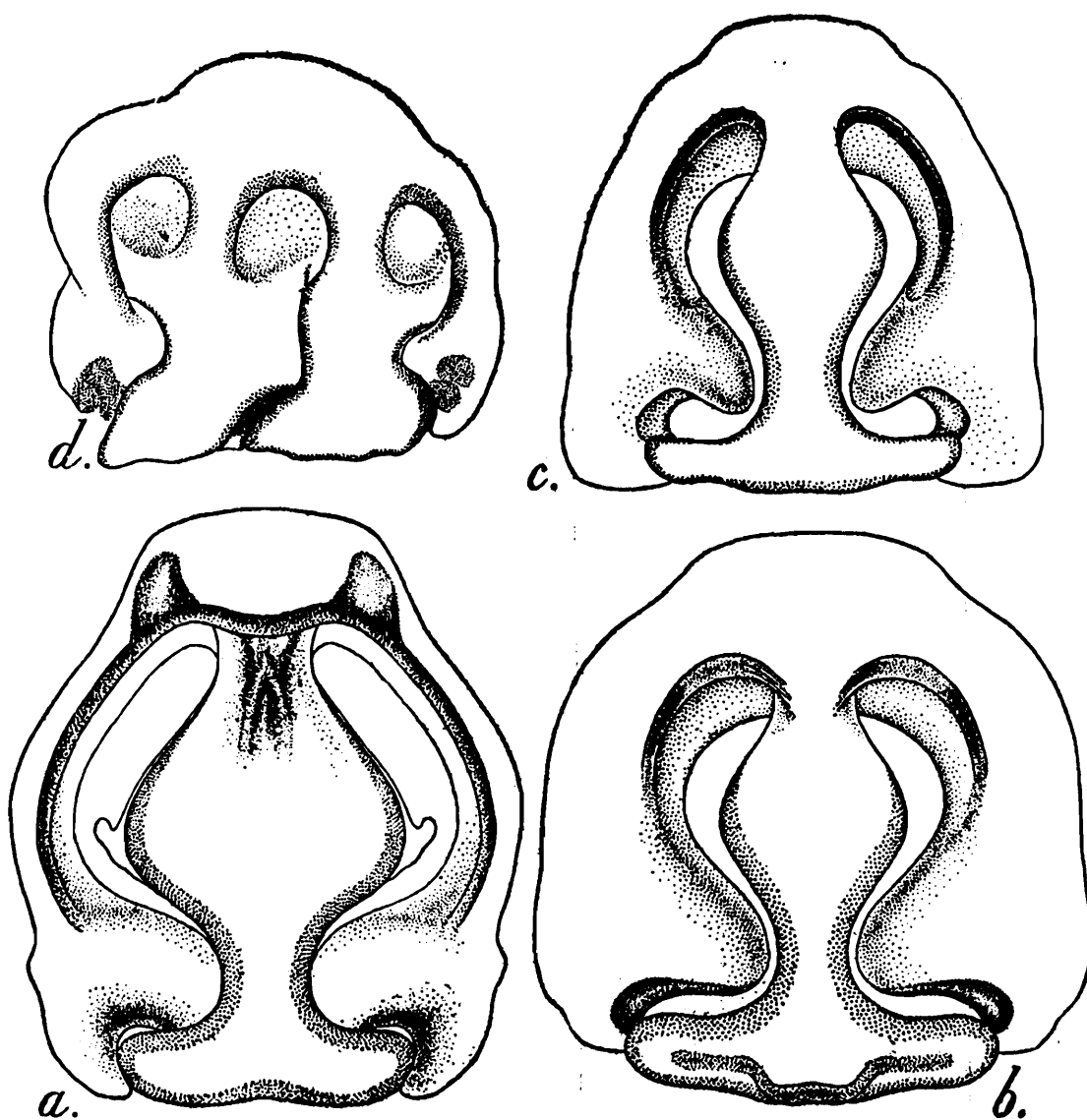
Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
5194 — H ₂	Afghanistan.	—	1♀.
5198 — H ₂	Taru, Peshawar, Pakistan, (under wheat stock on Ground eating, <i>Agrotis</i> moth.).	28. iv. 1916 ..	1♀.
5202 — H ₂	Rawalpindi, W. Panjab.	vii-viii. 1917 (Hod- gart.)	2♂♂, 2♀♀.
7661 — H ₂	Dharampur, ca. 5,000 ft., W. Himalayas, India.	16. v. 1913 (Phaku Ram).	3♀♀.
7659 — H ₂	Simla, W. Himalayas, India.	..	1♀.
5219 5214 —, — H ₂ H ₂	Pusa, Bihar.	21. vii. 1915 (T. B. Fletcher).	2♀♀.
5207 — H ₂	„	1-4. viii. 1914 (C. Ghosh.)	1♀.
5193 — H ₂	Siripur, Saran, Bihar.	viii. 1913 (Macken- zie.)	2♂♂, 6♀♀.
5195 — H ₂	Katihar, Purnea Dt., Bihar (on a plant in flower Garden).	8-13. viii. 1910 (C. Paiva).	2♀♀.
7656 — H ₂	Gmatia, Birbhum Dt.	..	1♂, 5♀♀.
5216 — H ₂	Indian Museum compound, Calcutta.	..	1♂, 3♀♀.
5215 — H ₂	„	21. iii. 1915 (F. H. Gravely).	1♀.
5203 5211 —, — H ₂ H ₂	Nepal valley, alt. 4,500-6,500 ft., E. Himalayas, India.	21. iii. 1915 (Man- ners Smith).	1♀♀.
5221 — H ₂	Sukna, alt. 1,000 ft., Darji- ling Dt., E. Himalayas, India.	iv-v. 1913 (Lord Carmichael).	1♂, 1♀.
7660 — H ₂	„	v. 1913, (Lord Car- michael).	1♀.
5212 — H ₂	Singla, alt. 1,500 ft., Darji- ling Dt., E. Himalayas, India.	(Lord Carmichael's Colln.).	6♂♂, 6♀♀.

Material examined—contd.

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
7664 — H ₂	Singla, alt. 1,500 ft., Darjiling Dt., E. Himalayas, India.	iv. 1913. (Lord Carmichael's Colln.).	1♀.
5218 5211 —, — H ₂ H ₂	Kalimpong, alt. 2,000-4,500 ft., Darjiling Dt., E. Himalayas, India.	? (S.W. Sutherland).	7♀♀.
5210 — H ₂	Kalimpong, Darjiling Dt., E. Himalayas, India.	1914 (S. W. Sutherland).	2♀♀.
5209 — H ₂	Darjiling Dt., alt. 1,000-3,000 ft., E. Himalayas, India.	v, vi. 1912 (Lord Carmichael's colln.).	5♀♀.
5205 — H ₂	Sikkim.	—	5♀♀.
5220 — H ₂	Assam-Bhutan frontier, Mangaldai Dt., Assam.	27-xii. 1910 (S. W. Kemp).	1♀.
5222 — H ₂	Podaspur, India.	—	3♂♂.
8582 — H ₂	Sibsagar, Assam.	—	1♀.
5223 — H ₂	Garohills, Assam.	(Godwin-Austin).	1♂.
5213 — H ₂	Arakan, Burma.	(F. Stoliczka).	1♂. 2♀♀.
5192 — H ₂	Rangoon, Burma.	(J. C. Blight).	1♀.
5915 — H ₂	Outline spurs, Kakhyin Hills, Burma.	11. ii. 1875 (J. Anderson).	1♀.
7663 — H ₂	Second defile, Irrawady, Burma.	5. iii. 1875 (J. Anderson).	1♀.
5204 — H ₂	Kosi Hah, Talé Sap, Singgora Province, Siam.	17. i. 1916 (N. Annandale).	1♀.

Remarks.—The female specimen from Baluchistan is mottled and ash coloured while only two of the specimens from Gmatia have the venter of the body marked with more prominent black striations and dorsal surface of the abdomen has the normal coloration.

The shape of the epigyneal plate is very variable as has been already pointed out by Gravely *op cit.* In the specimens from Pusa (Bihar) anterior part of the median piece of vulva gradually widens from its basal part, whereas the anterior part of the vulva in the specimens from Kakhyin Hills and Sibsagar (Text-fig. 2c.) is expanded into a circular plate filling a major portion of the anterior part of the cavity. In the specimens from Kalimpong, Kosi Hah, Assam-Bhutan frontier (Mangaldai district) and Nepal Valley the anterior part of the median piece is expanded as seen in the (Text-fig. 2b) and the shape of the vulva in these specimens presents an intermediary stage between the two extremes. In the specimens from Second defile, Irrawady (Text-



TEXT. FIG.—2.—a—*Lycosa nigrotibialis* Simon, Vulva from second defile Irrawady $\times 80$; b. *L. nigrotibialis* Smon, Vulva from Nepal $\times 110$; c. *L. nigrotibialis* Simon, vulva from Sibsagar $\times 110$; d. *L. kempî*, Grav. vulva of one abnormal female from *Paralectotypes*.

fig. 2a) anterior part of the median piece of vulva is so much expanded into a circular plate as to practically fill the anterior part of the cavity. The specimens from Kakhyin Hills, Second defile, Irrawady or Sibsagar cannot be defined as local races, because the condition of vulva in the specimens from the above mentioned localities has probably reached through a gradual change and more over there are also not many

examples and the specimens from Nepal Valley (Text. fig. 2b), Kalimpong, Kosi Hah and Assam-Bhutan frontier evidently indicate the intermediary stage between the two extremes.

The species has been previously recorded from Jalarpet (Salem district), Bangalore, Poona (India), Yunnan (China), Thayetmyo, Tenasserim, Burma.

Measurements.—Body 8-23 mm. ; carapace 4-10½ mm.

***Lycosa madani* Pocock.**

1901. *Lycosa madani*, Pocock, *Jour. Bombay Nat. Hist. Soc.* XIII, p. 486 [*Type-locality*: Chopda, E. Khandesh, India, *Type-specimens* in B. M. (N. H.) 1899-9-21, 385-388].
1928. *Lycosa madani*, Gravely, *Rec. Ind. Mus.* XXVI, p. 602.
1935. *Lycosa madani*, Dyal, *Bull. Dept. Zool. Panjab Univ. Lahore* I, p. 140.

Material examined.—

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
7724 H ₂	Kavalai, ca. 1,300-3,000 ft., Cochin State, S. India.	24-27. ix. 1914 (F. H. Gravely).	1 ♀.
2255 H ₂	Eastern Ghats, (under stones) at Nadur, 1,800 ft., Javadi Hills, S. India.	26-30. vi. 1929 (H. S. Pruthi).	2 ♀♀.
7702 H ₂	Bangalore, ca. 3,000 ft., Mysore, S. India.	6-12. v. 1921 (Madras Mus.).	3 ♀♀.
7735 H ₂	Barkuda Id., Chilka Lake, Orissa.	25. vii-4. viii (N. Annandale).	1 ♀.
7708 H ₂	Siripur, Saran, Bihar.	vii. 1913 (Macken- zie).	1 ♀.

Venter of abdomen in the specimens from Bangalore is marked with white striations, while in the specimens from Barkuda Island body is black ventrally and mottled with white dots dorsally.

The species has been recorded from Horsleykonda (Chittoor district), ca. 3,000-4,000 ft., Lahore (West Panjab) and has been reported to be common in Lahore.

Measurements.—Body 9-14 mm. ; carapace 5-7 mm.

***Lycosa kemp* Gravely.**

1924. *Lycosa kemp*, Gravely, *Rec. Ind. Mus.* XXVI, p. 602, fig. 3 (Type locality: Assam-Bhutan frontier, *Lectotype* Reg. No. 2270/18, Zoological Survey of India).
1935. *Lycosa kemp*, Dyal, *Bull. Dept. Zool. Panjab Univ. Lahore* I, p. 141, pl. XIII, fig. 42.

Material examined.—

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
7718 — H ₂	Assam-Bhutan frontier, Mangaldai Dt., Assam.	25-26.xii.1910 (S. W. Kemp).	1♂♂, 19♀♀. (<i>Paralectotype</i>).
2270 — 18	Ditto	Ditto	1♀. (<i>Lectotyps</i>).
7707 — H ₂	Darjiling Dt., 1,000-3,000 ft., E. Himalayas, India.	v-vi. 1912 (Lord Carmichael's colln.).	2♀♀.
7730 — H ₂	Darjiling Dt., 6,000 ft., E. Himalayas, India.	iv. 1914 (Lord Carmichael's colln.).	1♀.
7723 — H ₂	Singla, alt. 1,500 ft., Darji- ling Dt., E. Himalayas, India.	(Lord Carmichael's colln.).	2♂♂.

Remarks.—In one specimen (Body 15 mm. ; carapace 7 mm.) of the syntypic series an additional median epigyneal plate has been observed as seen in the Text fig. 2a. The specimen seems to be abnormal but at this stage nothing can be said emphatically until some more material of the kind is available. For the present it has been separated in a small tube from the lot and kept in the same tube containing the remaining specimens of the type series. It has only been recorded so far from Lawrence Gardens (West Panjab).

Measurements.—Body 18 mm. ; carapace 9 mm.

***Lycosa stictopyga* (Thorell).**

1895. *Tarentula (Trochosa) stictopyga*, Thorell, *Descriptive Catalogue of spiders of Burma*, pp. 232-234 [*Type-locality*: Rangoon and Tharrawaddy, *Type-specimen* in B. M. (N. H.) 1895-9-21, 770-773].
1924. *Lycosa stictopyga*, Gravely, *Rec. Ind. Mus.* XXVI, p. 602.

Material examined.—

Reg. No.	Locality.	Date and donor/ collector.	No of specimens.
2267 — 18	Bangalore, S. India.	6-12. v. 21.	1♀.
2265 — 18	Chitral, 5,000 ft., Kashmir.	Gilgit Mission colln.	1♀.
2247 — 18	Nasratabad, Pakistan.	25. xi. 1916	1♂.
2248 — 18	Lahore, W. Panjab, Pakistan.	(K. Narayan).	1♀.
7609 — H ₂	Siripur, Saran, Bihar.	viii. 1913 (Mackenzie).	1♀.
7605 — H ₂	Singla, alt. 1,500 ft., Darjiling Dt., E. Himalayas, India.	iv. 1913 (Lord Carmichael's colln.).	1♂, 8♀♀.
7607 — H ₂	Kalimpong, alt. 2,000-4,500 ft., Darjiling Dt., E. Himalayas, India.	(S. W. Sutherland).	1♀.
7604 — H ₂	Calcutta.		2♂♂, 7♀♀.
2264 — 18	Mowplon near Dak Bungalow, Khasi Hills, Assam.	12. x. 1927 (Mus. coll.).	2♂♂, 1♀.
7606 — H ₂	Garro-Hills, Assam.	(Gowdin—Austin).	1♀.
2266 — 18	Namkhan, N. Shan States, Burma.	xii. 1926 (H. S. Rao).	1♀.
7608 — H ₂	Singapore.	..	1♀.

The anterior row of eyes is slightly recurved.

Measurements.—Body 7½—9 mm. ; carapace 4 mm.

Lycosa himalayensis Gravely.

1924. *Lycosa himalayensis*, Gravely, *Rec. Ind. Mus.* XXVI, p. 603, fig. 3g (*Type-locality*: Kalimpong, Darjeeling district, India, *Lectotype*. Reg. No. 2271/18, Zoological Survey of India).

Material examined.—

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
7632 — H ₂	Kalimpong, Darjiling Dt., E. Himalayas, India.		2♂♂, 6♀♀. (<i>Paralectotype</i>).
2271 — H ₂	Ditto	Ditto	1♀. (<i>Lectotype</i>).
7630 — H ₂	Singla, alt. 1,500 ft., Dar- jiling Dt., E. Hima- layas, India.	iii. 1913 (Lord Carmichael's colln.).	1♂, 2♀♀.
7636 — H ₂	Ghumti, alt. 1,500 ft., Dar- jiling Dt., E. Himalayas, India.	iv. 1914 (Lord Carmichael's colln.).	1♂, 2♀♀.
7629 — H ₂	....	vi. 1914 (Lord (Carmichael's colln.).	1♀.
7644 — H ₂	Ghumti, alt. 2,500 ft., Dar- jiling Dt., E. Himalayas, India.	27. iii. 1910 (F. H. Gravely).	1♀.
7642 — H ₂	Pashok, alt. 2,500 ft., Darjiling Dt., E. Hima- layas, India.	26. v. 1914. vi. 1916 (F. H. Gravely).	1♂.
7640 — H ₂	Pashok, alt. 3,000 ft., Darjiling Dt., E. Hima- layas, India.	(F. H. Gravely).	2♀♀.
7637 — H ₂	Pashok, alt. 3,500 ft., Darjiling Dt., E. Hima- layas, India.	26. v. 1914. vi. 1916 (F. H. Gravely).	2♂♂, 1♀.
7635 — H ₂	Soom, alt. 4,000-5,000 ft., Darjiling Dt., E. Hima- layas, India.	9. vii. 1914 (Lord Carmichael's Colln.).	1♀.
7631 — H ₂	Sitong Ridge, ca. 4,700 ft., Darjiling Dt., E. Hima- layas, India.	22-28. x. 1919 (F. H. Gravely).	1♀.
7641 — H ₂	Nam Ting Pokari, Sitong Ridge, Darjiling Dt., E. Himalayas, India.	(S. W. Kemp).	1♀.
7638 — H ₂	Darjiling Dt., alt. 1,000- 3,000 ft., E. Himalayas, India.	(Carmichael's colln.).	1♀.
7633 — H ₂	Sonarpur, Assam.	(L. W. Middleton).	1♀.

Measurements.—Body 10-13 mm. ; carapace 5-6½ mm.

***Lycosa leucostigma* Simon.**

1885. *Lycosa leucostigma*, Simon, *Bull. Soc. Zool. Fr.* X, p. 10, (*Type-locality*: Gunktal, India).

1924. *Lycosa leucostigma*, Gravely, *Rec. Ind. Mus.* XXVI, p. 603, fig. 3 h.

***Material examined*.—**

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
$\frac{7601}{H_2}$	Cochin States, S. India.	ix. 1914 (F. H. Gravely).	1♂.
$\frac{7597}{H_2}, \frac{7599}{H_2}$	Barkuda Id., Chilka Lake, Orissa, India.	(F. H. Gravely).	1♂, 2♀♀, (1♂ under weed or stone).
$\frac{7600}{H_2}$	Siripur, Saran, Bihar.		1♂.
$\frac{7598}{H_2}$	Gmatia, Birbhum Dt., Bengal.	..	3♀♀.
$\frac{7603}{H_2}$	Calcutta.	(F. H. Gravely).	1 ♀.

The species has been recorded from Trivandrum, Ennur Kambakam Hill, 200-800 ft. (Chingleput district), Madras City; and also E. Khandesh.

Measurements.—Body $7\frac{1}{4}$ —10 mm. ; carapace $3\frac{1}{2}$ —5 mm.

***Lycosa punctipes* Gravely.**

1924. *Lycosa punctipes*, Gravely, *Rec. Ind. Mus.* XXVI, pp. 603, 604, fig. 3i
(*Type-locality*: Ulsoor tank, Bangalore, S. India, *Type-specimen*: Reg. No. 7736 Zoological Survey of India).

$\frac{\quad}{H_2}$,

Specimens of this species are intensely hairy and are generally yellowish in colour, some of them, however, are greenish. Vulva is provided with a pair of small circular plates, having an aperture slightly towards their inner side. Besides the characters already mentioned by Gravely *op. cit.* there are two pairs of longitudinal rows of brownish spots on the venter of the abdomen.

Material examined.—

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
7736 — H ₂	Bangalore, ca. 3,000 ft., Mysore, S. India.	6-12. v. 1921 (F. H. Gravely).	2♀♀ (♂1♀ Types).
7712 — H ₂	Lucknow, U. P.	29-30. iv. 1911 (S. W. Kemp).	1♀.
7740 — H ₂	Ballia village tank, Lalganj, Mirzapur, U. P.	18. viii. 1913 (John- stone).	1♂.
7739 — H ₂	Siripur, Saran, Bihar.	viii. 1913 (Mack- enzie).	1♂, 2♀♀.
2251 — H ₂	Bijalia band, 1 mile from Ramgarh Post office, Bihar.	3. x. 1928 (M. Sharif).	2♀♀.
7728 — H ₂	Museum tank, Calcutta.	30. v. 1907 (N. Annandale).	1♂, 1♀.

The species has been also recorded from Ennur, Chingleput district, S. India and Behrampur Court (Bengal), India.

Measurements.—Body 8 mm. ; carapace 4½ mm.

***Lycosa moulmeinensis* Gravely.**

1924. *Lycosa moulmeinensis*, Gravely, *Rec. Ind. Mus.* XXVI, p. 604, fig. 4a
(*Type-locality* : Moulmein, Lower Burma).

Remarks.—The species is represented by one male and two female specimens (Reg. No. 7705/H₂). The posterior medians are not more than a diameter apart. The sternum of female is marked with a mid-longitudinal blackish band, which has not been noticed in the specimens of other species of *Lycosa*. The male specimen is, however, devoid of the black median band on the sternum.

The species is known only from its type locality.

Measurements.—Body 7 mm. ; carapace 3½ mm.

***Lycosa carmichaeli* Gravely.**

1924. *Lycosa carmichaeli*, Gravely, *Rec. Ind. Mus.* XXVI, p. 604, fig. 4b (*Type-locality* : Sevoke, 1,000 ft., Darjeeling district, E. Himalayas, India.
Type-specimen : Reg. No. 7737, Zoological Survey of India, *Cotype-*

—
H₂
—
specimens : Reg. No. 7725, Zoological Survey of India).
—
H₂
—

Material examined.—

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
7737 H ₂	Sevoke, 1,000 ft., Darjiling Dt., E. Himalayas, India.	iii. 1914 (Lord Carmichael's colln.).	1♀ (<i>Type</i>).
7725 H ₂	....	..	1♂, 1♀ (<i>Cotype</i>).
7738 H ₂	Amangarh, Bijnoor Dt., U. P.	24. xi. 1910 (Mus. coll.).	1♂, 3♀♀.
7721 H ₂	Kathgodam, 1,200 ft., Kumaon, W. Darjiling Dt., Himalayas, India.	2. v. 1911 (S. Kemp).	1♀.
7727 H ₂	Darjiling Dt., 6,000 ft., E. Himalayas, India.	(Carmichael's colln.).	1♀.
7701 H ₂	Sukhwani, E. Himalayas, India.	16. ii. 1908	1♀.
7710 H ₂	Assam-Bhutan frontier, Mangaldai Dt., Assam.	26. xii. 1910 (S. W. Kemp).	26♂♂, 30♀♀.

The species has not been recorded from elsewhere.

Measurements.—(Type) Body 19 mm. ; carapace 8½ mm.

***Lycosa sumatrana* Thorell.**

1890. *Lycosa sumatrana*, Thorell, *Ann. Mus. Stor. nat. Genova* (2) X (=XXX), pp. 136-137 (*Type locality* : Sumatra).

1924. *Lycosa sumatrana*, Gravely, *Rec. Ind. Mus.* XXVI, pp. 604, 605, fig. 4c-e.

General coloration is dull brownish and the sternum of male specimens is often dark, but of females it is usually paler, except in the E. Himalayan specimens in which it is blackish and mottled with white patches.

Material examined.—

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
7697, 7693 H ₂ H ₂	Prambikulam, alt. 1,700- 3,200 ft., Cochin State, S. India.	16-24. ix. (F. H. Gravely).	2♂♂, 3♀♀.
7665 7677 H ₂ H ₂	Chalakudi, Cochin State, S. India.	14-30. ix. 1914 (F. H. Gravely).	4♂♂, numerous♀♀.
7682 H ₂	Stillbrook Garden, Conoor, S. India.		2♂♂, 2♀♀.
7692 H ₂	Bangalore, ca. 3,000 ft., Mysore, S. India.	6-12. v. 1921 (F. H. Gravely).	11♂♂, many♀♀.
7691 H ₂	Madras, S. India.	(Madras Mus.)	1♀.
7671 H ₂	Bombay.	..	1♀.
7689 H ₂	Saugor, C. P.	19-20. iii. 1919 (F. H. Gravely).	1♀.
7683 H ₂	Simla, W. Himalayas, India.	..	1♀.
7618 H ₂	Siripur, Saran, Bihar.	viii. 1913 (Mack- enzie).	1♀.
7686 H ₂	Kierpur, Purnea, Bihar.	9. ix. 1915 (C. Paiva).	2♀♀.
7617 7687 H ₂ H ₂	Gmatia, Birbhum Dt., W. Bengal.		5♀♀.
7688 H ₂	Nepal valley, alt. 4,500- 6,500 ft., E. Himalayas, India.	(Manners-Smith).	1♂, 3♀♀.
7690 H ₂	Darjiling Dt., 1,000- 3,000 ft., E. Himalayas, India.	v—vi. 1912 (Lord Carmichael's colln.).	5♀♀.
7679 H ₂	Sukna, alt. 1,000 ft., Dar- jiling Dt., E. Himalayas, India.	iv. 1913 (Lord Carmichael's colln.)	2♂♂, 1♀.

Material examined—contd.

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
7669 — H ₂	Singla, alt. 1,500 ft., Darjiling Dt., E. Himalayas, India.	iii/iv. 1913 (Lord Carmichael's colln.).	1♂, 14 ♀♀.
7670 — H ₂	Ghumti, alt. 1,500-5,000 ft., Darjiling Dt., E. Himalayas, India.	iv. 1914 (Lord Carmichael's colln.).	1♀.
7685 7696 —, — H ₂ H ₂	Tindharia, Darjiling Dt., E. Himalayas, India.	9. x. 1915 (Mrs. Drake)	3♀♀ with 1 Cocoon
7674 — H ₂	Rangheet Tea Estate, alt. 4,500-5,000 ft., Darjiling Dt., E. Himalayas, India.	ii—iii. 1916 (Lord Carmichael's colln.).	1♀.
7666 — H ₂	Pashok, alt. 3,000 ft., Darjiling Dt., E. Himalayas, India.	26. v-14. vi. 1916 (F. H. Gravely).	1♀.
7678 — H ₂	Kalimpong, Darjiling Dt., E. Himalayas, India.	1914 (S. W. Sutherland).	1♂, 9♀♀.
7684 — H ₂	Kalimpong, alt. 600-1,500 ft. Darjiling Dt., E. Himalayas, India.	—(S.W. Sutherland).	2♂♂, 6♀♀.
7676 — H ₂	Kalimpong, alt. 2,000-4,500 ft., Darjiling, Dt., E. Himalayas, India.	(S.W. Sutherland).	1♂, 1♀.
7675 7677 —, — H ₂ H ₂	Suriel, alt. 5,000 ft. Darjiling Dt., E. Himalayas, India.	11-31. x. 1917 (N. Annandale & F. H. Gravely).	1♂, 11♀♀.
7681 — H ₂	Sitong Ridge, alt. ca. 4,700 ft., Darjiling Dt., E. Himalayas, India.	22-28. x. 1917 (N. Annandale & F. H. Gravely).	1♂, 2♀♀.
7672 — H ₂	Calcutta, India.		Many ♂♂, many ♀♀.
7680 — H ₂	Dum-dum near Calcutta.	v. 1912 ..	1♂.
7691 — H ₂	Rangamati, Hill tracts, Chittagong, E. Pakistan.	11-16. v. 1915 (R. Hodgart).	1♀.
7695 — H ₂	Garo Hills, Assam.	(Godwin-Austin).	2♂♂, 5♀♀.

Remarks.—The sternum of female specimens collected from Suriel is blackish with white patches. In one specimen from Garo Hills (Assam) the sternum is uniformly pale whereas in other specimens from the same locality it is tawny brown or blackish with a paler area in the middle.

Shape of vulva in the specimens from Simla, Stillbrook, Cochin State and Eastern localities *viz.*, Darjiling district, is exactly alike. Shape of vulva in the specimen from Bombay and Garo Hills is almost alike excepting that the median piece of epigyneal plate in the specimen from the former locality is conical. Vulva in Kierpur specimen is similar to the Garo Hills one, except for the slight minute structural details.

The species has been previously recorded from Anuradhapura (Ceylon); Gudalur, *ca.* 3,000 ft., Ootacamund, *ca.* 6,700—8,000 ft., Keti, *ca.* 6,500 ft., Nilgiris, Yercaud, Shevaroy's, Bandipur (Mysore), Red Hills (Chingleput district), Horslaykonda, *ca.* 3,000—4,000 ft. (Chittoor district), Bandra, near Bombay; Camorta, Nicobars; Mt. Singalang, Sungei Balu, Ajer, and Mancior in Sumatra.

Measurements.—Body 5-10 mm; carapace 3-4½ mm.

Lycosa fletcheri Gravely.

1924. *Lycosa fletcheri*, Gravely, *Rec. Ind. Mus.* XXVI, p. 606, fig. 4f. [*Type locality*: Abbottabad, Hazara district, Pakistan, *Type-specimen*: Reg. No. 7743, Zoological Survey of India; Type specimen was found

H₂
understones Gravely].

Remarks.—Abdomen is mottled with ochraceous patches along the mid dorsal line.

Material examined.—

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
7743 H ₂	Abbottabad, Hazara Dt., N.W.F. Provinces, Pakistan (under stones).	12. vi. 1916 (T. B. Fletcher).	1♀ with one Cocoon (<i>Type</i>).
2226 18	Sandreh, a spring near Khewra, Salt Range, Panjab.	5. vii. 1922 (S. L. Hora).	1♀.
2246 18	Nalla below the Church at Dharamsala, 5,300 ft., Panjab.	2. vi. 1926 (S. L. Hora).	1♀.
7729 H ₁	Sutlej Valley below Simla, W. Himalayas.	6. v. 1910 (N. Annandale).	1♂.
7711 H ₂	Dharampur, <i>ca.</i> 5,000 ft., W. Himalayas.	16. v. 1913 ..	4♂♂, 1♀.

The species has not been recorded from elsewhere.

Measurements.—Body 10-11½ mm.; carapace 5 mm.

***Lycosa sutherlandi* Gravely.**

1924. *Lycosa sutherlandi*, Gravely, *Rec. Ind. Mus.* XXVI, p. 606, fig. 4g, (*Type-locality* : Singla, alt. 1,500 ft., Darjiling district, E. Himalayas, India. *Type-specimens*: Reg. No. 7719 Zoological Survey of India; *Cotype-*

H₂

specimens : also from the above locality, Reg. No. 7709, Zoological
H₂
Survey of India).

Material examined.—

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
7719 H ₂	Singla, alt. 1,500 ft., Darjiling Dt., E. Hima- layas, India.	iii. 1913 (Lord Car- michael's colln.).	1♂, 1♀ (Type)
7709 H ₂	Ditto.	v. 1913	4♀♀ (cotypes).
7706 H ₂	Pashok, alt. 1,000 ft., Darjiling Dt., E. Hima- layas, India.	26. v- 14. vi. 1916 (F. H. Gravely).	3♀♀ with one Cocoon.
7700 H ₂	Kalimpong, alt. 2,000-4,5000 ft., Darjiling Dt., E. Himalayas, India.	(S. W. Sutherland).	3♀♀.

The species is known only from the above mentioned localities. It seems to be a Himalayan species.

Measurements.—Body 8-10 mm. ; carapace 3½—5 mm.

***Lycosa mackenziei* Gravely.**

1924. *Lycosa mackenziei*, Gravely, *Rec. Ind. Mus.* XXVI, p. 606, fig. 4h (*Type locality* ; Bangalore, ca. 3,000 ft., Mysore State, S. India, *Type-specimen* : Reg. No. 7716 in Zoological Survey of India).

H₂

Material examined.—

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
7716 H ₂	Bangalore, ca. 3,000 ft., Mysore State, S. India.	6-12. v. 1921	1♂, 1♀ (Type).
2240 18	Punjpur Nallah, Dalhousi, Panjab.	v—vi. 1927 (S. L. Hora).	1♀.

Material examined—contd.

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
7742 7618 H ₂ H ₂	Siripur, Saran, Bihar.	viii. 1913 (Mackenzie)	5♀♀.
7741 H ₂	Dinapore, Bihar.	16. xii-14-23. 1915 (Caunter).	1♀.
2239 18	Bijalia Band, a big pond near the Ranchi Hazari- bagh Road and about a mile from the Ramgarh Post Office, Bihar.	3.x.1928 (M. Shariff).	2♀♀.
7717 H ₂	Calcutta.		1♂, 3♀♀.

The species has been previously recorded from Lahore (Pakistan) where it has been reported to be common.

Measurements.—Body 7-9 mm. ; carapace 3½-4 mm.

***Lycosa annandalei* Gravely.**

1924. *Lycosa annandalei*, Gravely, *Rec. Ind. Mus.* XXVI, pp. 606, 607, fig. 4i,
(Type locality : Madras City, S. India. Type-specimen : Reg. No. 7620

H₂

Zoological Survey of India).

Material examined.—

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
7620 H ₂	Madras City, S. India.	..	1♂, 1♀ (<i>Type</i>).
7628 H ₂	Ootacamund, Nilgiris, S. India.	vi. 1912 (R. B. S. Sewell).	1♀.
2244 18	From near the source of Nerbuda River alt. 3,300 ft., Rewa State, Central India.	i. 1927 (H. S. Pruthi).	1♀.
7625 H ₂	Multan, W. Punjab.	(Lt. Bomford)	1♂, 2♀♀.
7673 7618 H ₂ H ₂	Siripur, Saran, Bihar.	viii. 1913 (Mack- enzie).	7♂♂, numerous ♀♀ and one cocoon.

Material examined—contd.

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
2210 — 18	From harvested rice field near Panchet Hills Manbhum Dt., Bihar.	7. xii. 1948 (Sinha, Nath & Baugh).	1 ♀.
2213 — 18	From near a pond near Inanpur Inspection Bungalow, Manbhum Dt. Bihar.	24. xi. 1948 (S. C. Baugh).	1 ♀.
	Sitong Ridge, alt. 4,700 ft., Darjiling Dt., E. Himalayas, India.	22-28.x.1917 (N. Annandale & F. H. Gravely).	1♂, 3♀♀.
7616 — H ₂	Jor Pokhri, alt. 4,800 ft., (Sitong), Darjiling Dt., E. Himalayas, India.	22-28. x. 1917 (N. Annandale & F. H. Gravely).	1 ♀.
7622 — H ₂	Nam Ting Pokhri, Darjiling Dt., E. Himalayas, India.	vi- viii. 1918 (S. W. Kemp).	2♂♂, 6♀♀.
7617 — H ₂	Gmatia, Birbhun Dt., W. Bengal.	..	2♂♂, numerous ♀♀.
7614 — H ₂	Salt Lakes near Durgapur, Calcutta.	13. iii. 1915 (F. H. Gravely).	1 ♀.
7615 — H ₂	Dum-Dum near Calcutta.	May 1912 (M. C. Ghose).	1 ♀.
7624 — H ₂	Behrampur Court, Bengal.	13. vi. 1910 (S. W. Kemp).	1 ♀.
7626 — H ₂	Silicuri, Cachar, Assam.		1 ♀.
2227 — 18	Sibsagar, Assam.	(S. S. Peal).	2♂♂, 2♀♀.
4439 — H ₂	Manipur, Assam, India.	(N. Annandale).	1♂, 5♀♀.
7621 — H ₂	Chittagong, E. Pakistan.	18. i. 1913 (N. Annandale).	1 ♀.
2225 — 18	Nyaungbin, a village at the north end of the Inda- wgyi Lake, Myitkyina Dt., U. Burma.	7-10. xi. 1926 (B. Chopra).	1♂, a few ♀♀.
2245 — 18	Stream flowing into weedy tank near the I. B. Mongyai, N. Shan States, Burma.	January 1927 (B. N. Chopra & H. S. Rao).	1♂, 2♀♀.

Remarks.—The length of body is very variable. In one female example from Siripur, the last palpal joint is swollen and a little drawn out, apparently resembling the immature male palpus. In male examples from the same locality entire palpus, sternum and the area from anterior to the posterior lateral eyes are black. Male specimen from Mongyai, N. Shan States, Burma unlike the females from the same locality, is darker in coloration and the legs are marked with black bands. In the collection males are fewer than the females.

The species has been previously recorded from Trivandrum, Travancore, Bangalore, *ca.* 3,000 ft. Mysore, Red Hills (Chingleput district) and Horsleykonda, *ca.* 3,000-4,000 ft. (Chittoor district); the above localities are in S. India. It has also been reported from E. Khandesh (Bombay Presidency). It is now recorded for the first time from Burma.

The species is chiefly found beside water along with *L. sumatrana*.
Measurements.—Body 8-13 mm. ; carapace 4-5 mm.

Lycosa birmanica (Simon).

1884. *Pardosa birmanica*, Simon, *Ann. Mus. Stor. Nat. Genova*, XX, pp. 333, 334 (*Type-locality* : Minhla, Lower Burma).
1895. *Lycosa birmanica*, Thorell, *Descriptive Catalogue of Spiders of Burma*, pp. 242-244.
1924. *Lycosa birmanica*, Gravely, *Rec. Ind. Mus.* XXVI. pp. 607, 608, fig. 4j.
1935. *Lycosa birmanica*, Dyal, *Bull. Dept. Zool. Panjab Univ. Lahore* I, pp. 136-137, pl. xiii, figs. 36, 37.

Material examined.—

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
2257 — 18	Panchgami, W. Ghats, S. India.	(Rev. E. Blatter, S. J.).	1♀.
7650 — H ₁	Berhampore, West Bengal.	4-6. iii. 1919 (F. H. Gravely).	1♂, 2♀♀.
2256 — 18	A tributary of Nerbuda at Baratimala, 1½ miles from Amarkantak, alt. 3,300 ft., Rewa State, C. India.	ii. 1927 (H. S. Pruthi).	2♀♀.
2242 — 18	Kondho Nalla, a tributary of Nerbuda at Dione, alt. 2,650 ft., Rewa State, C. India.	iii. 1927 (H. S. Pruthi).	1♀.
2889 — H ₂	Barkuda Id. Chilka Lake, Orissa.	3-19. viii. 1919 (F. H. Gravely).	1♀.
2243 — 18	Sandreh, Khewra, Salt Range, Panjab.	5. vii. 1922 (S. L. Hora).	1♂, 2♀♀.

Materials examined—contd.

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
7648 H ₂	Mowai, Bara Banki, U. P.	(M. M. Khan)	1♀.
2258 18	Wyndham Fall Stream and its vicinity, Mirzapur Dt., U. P.	10. xii. 1946	1♀.
2241 18	Salebhata, from the edge of the tank, Brijal Sagar, Patna State, Orissa.	7. iii. 1946 (K. S. Pradhan).	1♂, 2♀♀.
2203 18	From grass, 1 mile E. of Inanpur Inspection Bungal- ow, Manbhum Dt., Bihar.	9. xii. 1948 (B. Nath).	2♀♀.
2202 18	From the bank of Nallah near Panchat Hills, 3 miles W. of Inanpur Ins- pection Bungalow, Man- bhum Dt., Bihar, India.	25. xi. 1948 (T. B. Sinha).	1 Juv.♂, 5♀♀ + 1 Juv.♀ + 1 Cocoon.
2221 18	From fields near Inanpur Inspection Bungalow, Manbhum Dt., Bihar.	29. xi. 1948 (T. B. Sinha).	2♂♂, 2♀♀.
2216 18	From the edge of tank Sultandih, 2 miles N. of Inanpur, Manbhum Dt., Bihar.	1. xii. 1948. (Nath, Sinha & Baugh).	2♂♂, 1♀.
2223 18	(From under stone) Chau- rasi, 3 miles W. of Inanpur Inspection Bungalow, Manbhum Dt., Bihar.	26. xi. 1948 (B. Nath).	1♀.
7652 H ₂	Purulia, Manbhum Dt., Bihar.	10. ii. 1912 (N. Annandale & F. H. Gravely).	1♀.
2217 18	Tal Danga, 1½ miles W. of Barakar Inspection Bungal- ow, Manbhum Dt., Bihar.	7. xi. 1948 (Baugh, Sinha & Nath).	1♂, 3♀♀.
2205 18	From the edge of a narrow nallah near Barakar Ins- pec. Bungalow, Burdwan Dt., W. Bengal.	5. xi. 1948 (Nath, Sinha & Baugh).	1♀.
2222 18	From near a ditch in village Gurdanga, Kult, 2 miles E. of Barakar Inspection Bungalow, W. Bengal.	21. xi. 1948 (Nath, Sinha & Baugh).	1♀.
7655 H ₂	Siripur, Saran, Bihar.	viii. 1913 (Mack- enzie).	4♂♂, 4♀♀.

Materials examined—concl'd.

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
7647 H ₂	Gmatia, Birbhum Dt., W. Bengal.	....	4♀♀.
7651 H ₂	Indian Museum, Calcutta.	....	5♀♀.
7649 H ₂	Dum-Dum, near Calcutta.	v. 1912 (M. C. Ghose).	3♂♂, 5♀♀.
7653 H ₂	Singla, alt. 1,500 ft., Dar- jiling Dt., E. Himalayas, India.	ii-v. 1913 (Lord Carmichael's colln.).	1♂, 1♀.
7645 H ₂	Sukhwani.	16. ii. 1908.	1♀.
7654 H ₂	Tavoy, Burma.	5. i. 1885 (Mus. collr.).	2♂♂, 7♀♀.

Remarks.—Carapace is uniformly dark and is devoid of pale median and submarginal bands. Sternum is almost dark and the abdomen in the anterior median area is either entirely black or marked with an ochraceous streak. Palpus of male differs in coloration from that of female. In the collection female specimens from Baratimala, *ca.* 3,300 ft. Rewa State, unlike typical specimens of the species, are interesting in having the spines on the ventral side of the first tibia abnormally long and the apices of the preceding pair overreaching the base of the succeeding pair. This is a characteristic feature of the genus *Pardosa*.

The species has been previously recorded from Ootacamund, Bangalore, *ca.* 6,700-8,000 ft., Coonoor *ca.* 5,700-6,000 ft. (Nilgiris), Enur, (Chingleput district), Horsleykonda *ca.* 3,000-4,000 ft., Madras City and also from Bandra near Bombay. It has also been recorded from Lahore (W Panjab, Pakistan) and between Chaibassa and Chakradharpur, Bihar, India; Tharrawaddy and Rangoon, Burma and Java.

The specimens of the species are very common in damp places and are generally seen running about among dead leaves or in open grounds having crevices or fissures for concealment. The species has been reported to be very common in Lahore.

Measurements.—Body 4-8 mm. ; carapace 2-3½ mm.

***Lycosa quadrifer* Gravely.**

1924. *Lycosa quadrifer*, Gravely, *Rec. Ind. Mus.* XXVI, p. 608, fig. 4k (*Type-locality*: Anuradhapura, *ca.* 3,000 ft., Ceylon. *Type-specimen*:

7745

No. — Zoological Survey of India).

H₂

Materials examined.—

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
7745 H ₂	Anuradhapura, ca. 3,000 ft. Ceylon.	31.iii-2.iv. 1923 (F. H. Gravely).	1♂ 1♀. (<i>Type</i>).
7746 H ₂	Peradeniya, Ceylon	....	1♀ with a Cocoon.
7727 H ₂	Prambikulam, alt. 1,700- 3,200 ft., Cochin State, S. India.	(F. H. Gravely)	1♀.

The species has been reported to be very common in Ceylon where it has been observed in association with *L. birmanica*.

The species has been previously recorded from Hambantota, Ceylon and from Covelong, Enur, Kambakkam Hills, alt. 200-800 ft., Chingleput district, Mysore, Madras City and Bangalore ca. 3,000 ft., South India. It has not been recorded from Northern India.

Measurements.—Body 7-10 mm.; carapace 3-4 mm.

In addition to the above mentioned species of *Lycosa* there are also two extra Indian species as follows :—

(i) *Lycosa cuneata* Clerck, Reg. No. $\frac{8320}{6}$ from Europe is represented in the collection by one male and two female examples.

(ii) *Lycosa albofasciata* Biulla, Reg. No. $\frac{8319}{H_2}$ from Europe is represented in the collection by 3 male and one female examples, and

(iii) *Trochosa ruricola* (de Geer), Reg. No. $\frac{8321}{H_2}$ from Europe is represented in the collection by one female and two male examples.

Genus *Venonia* Thorell.

(*Type* : *V. coruscans* Thorell. *Type-locality* : Singapore).

1894. *Venonia*, Thorell, *Bull. Soc. Ent. Ital.* XXVI, p. 332.

1924. *Venonia*, Gravely, *Rec. Ind. Mus.* XXVI, p. 608.

Anterior row of eyes is strongly procurved and the anterior median eyes are smaller than the anterior laterals, while the posterior median eyes are bigger than the posterior laterals. Posterior lateral eyes are rarely less than one diameter apart and the posterior eyes form a trapezium. Cephalothorax is long and its anterior part is slightly raised. Posterior margin of the mandible is armed with three teeth and the anterior margin of the maxillary lobe is truncated. The posterior spinnerets are definitely longer than the anterior spinnerets. Superior tarsal claws are densely pectinated and the inferior tarsal claws are armed with four teeth. Legs IV, I, II, III. *i.e.*, fourth leg is longer than first and first is longer than second or third which are equal in length.

Venonia himalayensis Gravely.

1924. *Venonia himalayensis*, Gravely, *Rec. Ind. Mus.* XXVI, pp. 608, 609, fig. 41, (*Type-locality* : Rungneet Tea Estate, alt. 4,500-5,000 ft., Darjiling district, E. Himalayas, India. *Cotypes* also from the above locality. *Type-specimen* : Reg. No. 7732 and *Cotype* specimens, Reg. No.

7744 H₂
 ———, Zoological Survey of India.
 H₂

Materials examined.—

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
7732 H ₂	Rungneet Tea Estate, alt. 4,500-5,000 ft., Darjiling Dt., E. Himalayas, India	Feb.-March 1914.	1♂, 1♀ (<i>Type</i>).
7744 H ₂	Rungneet Tea Estate, alt. 4,500-5,000 ft., Darjiling Dt., E. Himalayas, India.	Feb.-March 1914.	1♂, a few ♀♀ (<i>Cotypes</i>).
7747 H ₂	Darjiling Dt., alt. 6,000 ft., E. Himalayas, India.	1. iv. 1914 (Lord Carmichael's colln.).	1♂.

Remarks.—Abdomen is dark brownish above and marked with pale spots arranged in three rows. Males and females are alike in coloration.

The species has not been recorded from elsewhere.

Measurements.—Body 3½ mm.; carapace 1½ mm.

Genus **Pardosa** Koch.(Type: *P. striatipes* Koch).1848. *Pardosa*, Koch, *Die Arachniden* XIV(3), p. 100.1924. *Pardosa*, Gravely, *Rec. Ind. Mus.* XXVI, p. 609.1935. *Pardosa*, Dyal, *Bull. Dept. Zool. Panjab Univ. Lahore* I, p. 144.

The genus *Pardosa* Koch is closely allied to *Lycosa* Latr. but markedly differs from it in having the anterior part of the carapace much elevated and vertical. Eyes of the second row are broader than those of the first row. Tibial spines are very long with their apices extending beyond the base of succeeding pair of spines. Fourth metatarsus is longer than patella and tibia together.

It is a cosmopolitan genus.

Pardosa pusiola (Thorell).1891. *Lycosa pusiola*, Thorell, *K. Svenska Vet. Akad. Handl.* XXIV(2), p. 65.1924. *Pardosa pusiola*, Gravely, *Rec. Ind. Mus.* XXVI, pp. 609, 610, fig. 5a.*Materials examined.*—

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
<u>7734</u> H ₂	Peradeniya, Ceylon.	26. vi. 1910 (E. S. J.).	1♀.
<u>7733</u> H ₂	Suriel, alt. 5,000 ft., Dar- jiling Dt., E. Himalayas, India.	....	1♀.

It has been previously recorded from Tharrawaddy, Aj Mancior and Kajee, Burma ; Nias and Pinang (Sumatra) Sarawak, Borneo and Java.

Measurements.—Body 5-8 mm. ; carapace 2-3 mm.

Pardosa atropalpis Gravely.

1924. *Pardosa atropalpis*, Gravely, *Rec. Ind. Mus.* XXVI, fig. 5b (*Type locality* :
7726
Madras City, S. India. *Type-Specimen* : Reg. No. —, Zoological
H₂
Survey of India).

Abdomen and the lateral sides of the carapace of the specimens examined are pale in colour.

Materials examined.—

Reg. No.	Locality.	Date and donor / collector.	No. of specimens.
7726 — H ₂	Madras City, S. India.	(Madras Museum).	1♂, 1♀ (<i>Type</i>).
2887 — H ₂	Barkuda Id., Chilka Lake, Orissa.	3-12. viii. 1919 (F. H. Gravelly).	2♂♂, 1♀.
2214 — 18	Inanpur (from grass) Manbhum Dt., Bihar.).	25.xi.1948 (B. Nath)	1♀.
2200 — 18	½ mile S. of Inanpur, Manbhum Dt., Bihar (From grass).	24. xi. 1948 (B. Nath).	6♀♀, 3♂♂ + (Juv. 4♀♀, 1♂).
2215 — 18	Raghunathpur, Manbhum Dt., Bihar.	6. xii. 1948 (Nath Sinha & Baugh).	1♂ + 1♂ (Juv. 4♀♀, 8♀♀.).
2218 — 18	From the edge of a tank Sultandih, 2 miles. N. of Inanpur, Manbhum Dt., Bihar.	1. xii. 1948 (Nath, Sinha & Baugh).	1♂, 1♀.
2219 — 18	Durgapur, Manbhum Dt., Bihar.	20. xi. 1948 (Nath, Sinha & Baugh).	1 Juv. ♂, 1♀ + 1 Juv. ♀.
2211 — 18	From the foot of Panchet Hills, 1½ mls. S. of Inanpur, Manbhum Dt., Bihar.	10. xii. 1948 (Nath, Sinha & Baugh).	1♀ + 1♀ Juv.
2209 — 18	From the bank of Purulia Lake, Manbhum Dt., Bihar.	8. xii. 1948 (Nath, Sinha & Baugh).	1♂, 2♀♀.
2201 — 18	Collected from fields near Mugma, Manbhum Dt., Bihar.	9.xi.1948 (S. C. Baugh).	1♂, 3♀♀ + 1 Juv. ♀.
2212 — 18	From ⁴ under stones, Chaurasi, 3 miles W. of Inanpur, Manbhum Dt., Bihar.	26. xi. 1948 (B. Nath).	1♀.
2224 — 18	(On ground) Kanja Pahar, Manbhum Dt., Bihar.	20. xi. 1948 (Nath, Sinha & Baugh).	1♀ + 4♀♀ Juv.
2207 — 18	From the Compound of Barakar Inspection Bungalow, Burdwan Dt., W. Bengal.	5. xi. 1948 (Sinha, Nath and Baugh).	1♂, 1♀ + 1 Juv.♀.

The species has also been recorded Bandipur, *ca.* 3,000 ft.; Mysore State. Gudalur, *ca.* 3,000 ft.; foot of Nilgiris; Horsleykonda, *ca.* 3,000-4,000 ft.; Chittoor district and Nellore in South India. It has not been reported from North India as yet.

Measurements.—(Type) Body $4\frac{3}{4}$ mm.; carapace $2\frac{1}{2}$ mm.

***Pardosa oakleyi* Gravely.**

1924. *Pardosa oakleyi*, Gravely, *Rec. Ind. Mus.* XXVI, p. 610, fig. 5c (*Type-locality* : Ootacamund, ca. 6,700-8,000 ft., Nilgiris, S. India. *Type-specimen* : Reg. No. $\frac{7704}{H_2}$, Zoological Survey of India).

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
$\frac{7704}{H_2}$	Ootacamund, ca. 6,700-8,000 ft., Nilgiris, S. India.	20-30. v. 1921 (F. H. Gravely).	1♂, 1♀ (<i>Type</i>).
$\frac{2259}{18}$	Khewra, Salt Range, Punjab.	23-30. ix. 1930 (Drs. S. L. Hora & H. S. Pruthi).	2♀♀.
$\frac{7731}{H_2}$	Siripur, Saran Dt., Bihar, India.	viii. 1913 (Mackenzie.)	2♀♀.
$\frac{2204}{18}$	Mugma, Manbhum Dt., Bihar.	9. xi. 1948 (T. B. Sinha).	4♀♀, 1♂.
$\frac{2208}{18}$	From the edge of a Nallah near the base of Panchet Hills, 3 mls. W. of Inanpur, Manbhum Dt., Bihar.	25. xi. 1948 (T. B. Sinha).	1♀.
$\frac{2206}{18}$	From the edge of Purulia Lake, Manbhum Dt., Bihar.	8. xii. 1948 (Nath, Sinha & Baugh).	1♀ + 1♀ Juv.
$\frac{2220}{18}$	Tal Danga 1½ miles W. of Barakar Inspection Bungalow, Manbhum Dt., Bihar.	7. xi. 1948 (Nath, Sinha & Baugh).	1♂, 3♀♀.

The two specimens collected from Siripur slightly differ in the structural details of vulva. The species is now recorded from the Panjab (Pakistan).

Measurements.—Body 5 mm. ; carapace $2\frac{1}{2}$ mm.

***Pardosa leucopalpis* Gravely.**

1924. *Pardosa leucopalpis*, Gravely, *Re. Ind. Mus.* XXVI, pp. 610, 611, fig. $\frac{7748}{H_2}$ 5d (*Type locality* : Madras City, *Type-specimen* : Reg. No. $\frac{7748}{H_2}$, Zoological Survey of India).
1935. *Pardosa leucopalpis*, Dyal, *Bull. Dept. Zool. Panjab Univ. Lahore* 1, p. 144.

Material examined.—

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
7748 — H ₂	Madras City, S. India.	..	1♂, 1♀ (<i>Type</i>).
2261 — 18	Chappanam Island, E. of Kumbalam and the eastern most limit of the back water, Cochin State, S. India.	6-7. i. 1928 (H. S. Rao).	2♀♀.
2260 — 18	Creak a little beyond the ferry, Vizagapatam, S. India.	v-vi. 1926 (H. S. Rao & G. Varngis).	1♀.
2888 — H ₂	Barkuda Id., Chilka Lake, Orissa.	3-19. viii. 1919 (F. H. Gravely).	6♂♂, 2♀♀.

The species has been previously recorded from Galle, Ceylon ; Enur, Chingleput district, S. India and Lahore (Pakistan).

Measurements.—Body 7-8 mm. ; carapace 3-3½ mm.

There is also an extra Indian species *Pardosa armentata*, Reg. No, 8323/6, from Europe and is represented in the collection by a single female.

Genus **Evippa** Simon.

(Type *E. arenaria* (Audouin).

1882. *Evippa*, Simon, *Ann. Mus. Stor. Nat. Genova*, XVIII, p. 222.

1924. *Evippa*, Gravely, *Rec. Ind. Mus.* XXVI, p. 611.

The superior claws are long, slender and toothed only at the base. Anterior portion of carapace is somewhat abruptly elevated forming a distinct angle with its lower or posterior portion. Ventral margin of chelicerae bears only two teeth, while the dorsal margin is armed with three teeth.

The genus is distributed in Africa, Egypt, India and Ceylon.

Evippa rubignosa Simon.

1885. *Evippa rubignosa*, Simon, *Bull. Soc. Zool. Fr.* X, p. 11 (*Type-locality* : Guntakal, India).

1924. *Evippa rubignosa*, Gravely, *Rec. Ind. Mus.* XXVI, p. 611, fig. 5e.

The species is represented in the collection by only one female example from Samagooting, Assam (Reg. No. $\frac{7703}{H''}$, coll. Godwin-Austin, Date ?)

The species has also been previously recorded from Cuddapah, S. India.

Measurements.—Body 7 mm. ; carapace 3 mm.

***Evippa praelongipes* (Cambridge).**

1870. *Lycosa praelongipes*, Cambridge, *Proc. Zool. Soc. Lond.*, pp. 822, 823, pl. 1., figs. 3a-f. (*Type-locality* : Sinai).

1924. *Evippa praelongipes* ?, Gravely, *Rec. Ind. Mus.* XXVI, p. 611.

Material examined.—

Reg. No.	Locality.	Date and donor/ collector.	No. of specimens.
7749 — H ₁	Kachh.	....	3♀♀.
2262 — 18	Rawalpindi, W. Pakistan.	vi-vii. 1917 (R. Hodgart).	1♀.

Remarks.—The superior claws in the specimen from Rawalpindi are slightly shorter than that of the typical specimen. Though the character of the tarsal claw is a generic character, even then the specimen has been assigned to this species as in all the other characters excepting that of the superior claw, the specimen confirms to the description given by Cambridge (1870).

In India the species was known only from Assam, and is now recorded for the first time from the Panjab, Pakistan.

Measurements.—Body 11 mm.; carapace 5 mm.

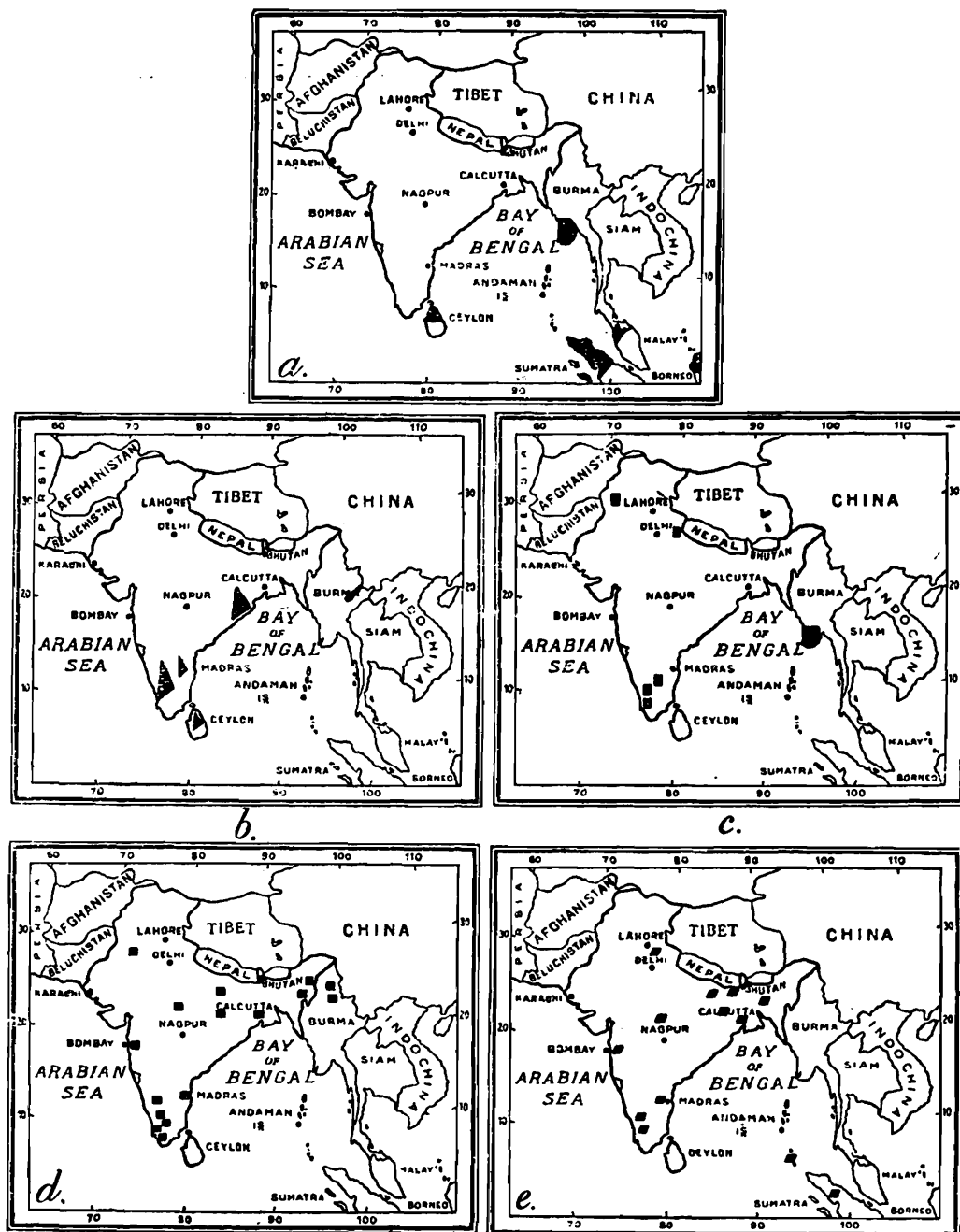
SUMMARY OF GEOGRAPHICAL DISTRIBUTION.

The geographical ditribution of the species given below is very interesting and they need explanation for their discontinuous occurrence in Sumatra, Borneo, Java, Malaya, Burma and South India and their absence from the intervening areas. These anomalies in distribution can very well be accounted for by the Vindhya-Satpura hypothesis advanced by Hora (1949).

Pardosa pusiola (Thor.) This spider is known from Java, Borneo, Sumatra, Malaya, Lower Burma, Darjeeling, district of E. Himalayas and Ceylon, but is not recorded from Peninsular India. This leads one to the belief that there was at one time a land connection between the Malayan region on one side and Ceylon on the other though, of course, no such connection ever existed as enunciated by the "Continuous Range Theory" The other probable route of the migration of this spider from the Malayas to Ceylon seems to be *via* the Satpura trend of mountain ranges. It is evident that the species has died out in the intervening areas or has changed into other species due to isolation and segregation.

Hippasa pantherina Pocock is now recorded from the Darjiling district while it was hitherto known from Barkuda Islands, Western Ghats, Madras and Ceylon. This is very closely allied to *H. agelenoides* Simon recorded from Lower Burma, Dehra Dun, North-West Frontier Provinces (W Pakistan), Western Ghats, and Shevaroy Hills. It seems

that *H. agelenoides* might have given rise to *H. pantherina* whose occurrence in the E. Himalayas shows the connecting link. The occurrence of this species in Barkuda and upper eastern areas can be well assumed to be the results of some off-shoots or migration of some stock over the eastern ghats. The latter proposition is highly improbable and needs further confirmation.



TEXT. FIG. 3.-a.—Map of India, Burma and Ceylon showing the distribution of *Pardosa pusiola* Koch ; b. Map of India, Burma and Ceylon showing the distribution of *Hippasa pantherina* Pocock. c. Map of India, Burma and Ceylon showing the distribution of *Hippasa agelenoides* Simon. d. Map of India, Burma and Ceylon showing the distribution of *Lycosa annandalei* Grav. e. Map of India, Burma and Ceylon showing the distribution of *Lycosa sumatrana* Thorell.

Lycosa annandalei Gravely is recorded from upper Burma, Darjiling district, Calcutta, Chota Nagpur, Multan, Rewa, Bombay, Western Ghats and Madras, while an allied species *L. sumatrana* Thor. is known from Sumatra, Assam, Darjiling district, Chota Nagpur, Bihar, Bombay, Western Ghats and Madras. The occurrence of these closely allied species, which may be said to be a bit widely distributed, in somewhat discontinuous areas is puzzling. It is likely that the more widely distributed *L. sumatrana* has given rise to *L. annandalei* and if this is so the paths of migration might have been over the Vindhya, Satpura and Himalayas. Parallel evolution also cannot be ruled out in this case.

The distribution of the remaining species which, however, does not seem to be of much zoogeographic importance, is as follows: Seven species are recorded from South India, one from Peninsular India, one from North-West India (W Pakistan), seven from the North-East Himalayas including Burma. There are two species which also extend into the Palearctic region. The remaining are widely distributed in the Indian region.

REFERENCES.

- * AUDOUIN, 1826.—*In, Savigny's "Description de l' Egypte, Arachnides"* (Paris, 1826). -
- CAMBRIDGE, O. P., 1870.—“Notes on a collection of Arachnida made by J. K. Lord, Esq., in the peninsula of Sinai and on the African borders of the Red Sea” *Proc. Zool. Soc. London*, pp. 818-823, pl. 1.
- CHOPRA, B., 1946.—Zoological Survey of India, 1942-45. *Red. Ind. Mus.* XLIV, pp. 347-355.
- DAHL, F., 1908.—“Die Lycosiden Wolfspinen Deutschland and ihre Stellung in Haushalte der Natur. Nach statistischen untersuchungen darges tellt.” *Halle. Nova Acta Leop.*, LXXXVIII, pp. 175-678.
- DYAL, S., 1935.—Fauna of Lahore, 4. Spiders of Lahore, *Bull. Dept. Zoology Panjab Univ. Lahore* I, pp. 119-252, pls. xi-xvii.
- GRAVELY, F. H., 1924.—Some Indian spiders of the family Lycosidae. *Rec. Ind. Mus.* XXVI, pp. 587-613.
- HORA, S. L., 1949.—Satpura Hypothesis of the distribution of the Malayan Fauna and Flora to Peninsular India. *Proc. Nat. Inst. Sci. India* XV, No. 8, pp. 309-314.
- KOCH, C. L. & HAHN, C., 1848.—Die Arachniden, XIV(3).
- * LATREILLE, P. A., 1803-1804.—*Nouveau dictionnaire d' Histoire Naturelle, applique'aux Arts*, etc. I-XXIV
- POCOCK, R. I., 1899.—“Diagnoses of some new Indian Arachnida.” *Jour. Bombay Nat. Hist. Soc.* XII, pp. 744-753.
- 1900.—“Arachnida” in *Faun. Brit. India* (London, 1900), 279 pp., 89 text-figs.
- 1901.—“Description of some new species of spiders from British India.” *Jour. Bombay Nat. Hist. Soc.* XIII, pp. 478-498.

* Could not be consulted in original.

REIMOSER, E., 1934.—*Araneae* aus Süd-Indien. *Rev. suisse Zool.* Geneva. XLI, p. 4.

——— 1938.—Beitrag zur spinnerfauna von Erythraea. *Mem. Soc. Ent. Ital. Genova* XVI, pp. 16-24, 4 text-figs.

SIMON, E., 1882.—Etude sur les Arachnides de l' Yemen meridional, Pt. II, *Ann. Mus. Stor. Nat. Genova* XVIII, pp. 205-260, pl. viii.

——— 1884.—"Arachnides recueillis en Birmanie par M. le Chevalier, J. B. Comotto et appartenant au Musée civique d' Histoire Naturelle de Gênes." *Ann. Mus. Stor. Nat. Genova* XX, pp. 325-372, text-figs S. 1-10.

——— 1885.—"Materiaux pour servir à la fauna arachnologique de l' Asia meridionale." *Bull. Soc. Zool. Fr.* X, pp. 1-39 and 436-462, pl. X.

——— 1897-1903.—"*Histoire Naturelle des Araignées*", II (Paris, 1897-1903).

THORELL, T. 1887.—"Viaggio di L. Fea in Birmania regioni vicine. II Primo Saggio sui Ragni Birmani." *Ann. Mus. Stor. Nat. Genova* (2a)V (=XXV), pp. 5-417.

——— 1890.—"Diagnoses Araneorum aliquot novarum in Indo-malesia inventarum." *Ann. Mus. Stor. Nat. Genova* (2a)X (=XXX), pp. 132-172.

——— 1891.—"Spindlar från Nikobarerna Och andra delar af Södra Asien, etc." *K. Sv. Vet.-Ak. Handl.* XXIV (2), pp. 1-149.

——— 1894.—"Decas Araneorum in insular Singapore a Cel Th. workman inventarum." *Bull. Soc. Ent. Ital.* XXVI, pp. 321-355.

——— 1895.—"*Descriptive catalogue of the spiders of Burma based upon the collection made by Eugene W Oates and preserved in the British Museum*," (London, 1895.) XXXVI+406 pp.

WALCKENAER, M. LE BARON, 1837.—"*Histoire Naturelles des Insectes Aptères* I" (Paris, 1837).